Transport and Communications Bulletin for Asia and the Pacific

No. 75

Road Maintenance Funds

United Nations
ESCAP

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC

ESCAP is the regional development arm of the United Nations and serves as the main economic and social development centre for the United Nations in Asia and the Pacific. Its mandate is to foster cooperation between its 53 members and 9 associate members. ESCAP provides the strategic link between global and country-level programmes and issues. It supports Governments of the region in consolidating regional positions and advocates regional approaches to meeting the region's unique socio-economic challenges in a globalizing world. The ESCAP office is located in Bangkok, Thailand. Please visit our website at <www.unescap.org> for further information.

The shaded areas of the map are ESCAP Members and Associate members.

Cover design by Bryan Joseph Granados Sabroso

TRANSPORT AND COMMUNICATIONS BULLETIN FOR ASIA AND THE PACIFIC

No. 75
Road Maintenance Funds

United Nations

New York, 2005

ECONOMIC AND SOCIAL COMMISSION FOR ASIA AND THE PACIFIC

Transport and Communications Bulletin for Asia and the Pacific

No. 75

Road Maintenance Funds

United Nations publication
Sales No. E.05.II.F.34

Manufactured in Thailand
ISBN: 92-1-120448-8
ISSN: 0252-4392
ST/ESCAP/SER.E/75

ESCAP WORKS TOWARDS REDUCING POVERTY AND MANAGING GLOBALIZATION

Editorial statement

The *Transport and Communications Bulletin for Asia and the Pacific* is a peer-reviewed journal published once a year by the Transport and Tourism Division of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). The main objectives of the *Bulletin* are to provide a medium for the sharing of knowledge, experience, ideas, policy options and information on the development of transport infrastructure and services in the Asian and Pacific region; to stimulate policy-oriented research; and to increase awareness of transport policy issues and responses. It is hoped that the *Bulletin* will help to widen and deepen debate on issues of interest and concern in the transport sector.

Road development has been considered crucial for the sustained growth of many economies of the region and for closer regional integration in general. As such, many national Governments in the region are now implementing impressive road development programmes. However, funds available to the road sector from government budgetary allocations are often significantly less than the amount required to implement new road projects and maintain the road network in a stable long-term condition as well as undertake justified improvements.

Faced with this problem, governments have taken various alternative measures to secure funding. One of these alternative measures is the establishment of a dedicated road fund. Governments in many countries have already set up such funds as a sustainable mechanism for financing the needs of their road sectors and many others are known to be considering establishing them. There are various issues involved in the creation and successful management and operation of a road fund. Their success largely depends on satisfactory resolution of these issues as evidenced by the experiences of current and earlier funds.

In consideration of the importance and wide interest in the subject, ***road maintenance funds*** was chosen as the theme for the current issue of the *Bulletin,* which includes six articles. The first two articles provide regional overviews on experiences from Latin America and the Caribbean and Africa. The other four are on country experiences – three from Asia and one from Africa.

The first article looks at the experience of road funds established in countries of the Latin American and Caribbean region. It compares the management structure and operational aspects of these funds. The article also discusses the fundamental issues in road maintenance and the general

principles for creating sustainable road maintenance funds. It describes the approach taken by each country and the difficulties they encountered and finally draws lessons that have been learned. Experience from Latin American countries suggests that the establishment of road funds had greatly helped them to stop the rapid decline in the value of their road assets and to improve the quality of road infrastructure. The long-term sustainability of road funds, however, remains in question. It is the operating environment in many countries that seems to pose the greatest challenge for the success of road maintenance funds.

The focus of the second article is on reforms in road maintenance financing, including the establishment of second generation road funds in sub-Saharan African countries. The article reports that since the early 1990, progress has been achieved by applying improved policies and more appropriate management structures to road development. Until now, planners have focused on road maintenance financing and addressing the deficits in this area. However, experience from the region suggests that raising resources alone is not enough. More attention has to be paid to the overall effectiveness of road management. The author suggests that efforts in this regard need to focus on four areas: creating efficient, autonomous agency structures to manage road programme, strengthening government oversight capability, exploiting new technologies to reduce costs and utilizing performance-based approaches to contracting.

A Central Road Fund has existed in India since 1929. However, its resource base was extremely limited until 2000. The Fund was totally revamped by an act in 2000 to increase its resource base and scope of coverage. A few states have also set up their own dedicated road funds. A number of measures for financing road development and maintenance, including some off-budget financing mechanisms, have been initiated at different levels of government. Even at local body levels, resources are generated by levy of cess on agricultural produce. A part of the funds raised in this manner is utilized for the maintenance of rural roads. The country has been moving towards creating second generation road funds both at the central and state government levels. Efforts are also being made to strengthen the institutional arrangements for proper planning of maintenance interventions and their effective delivery on the ground. These experiences are shared in this first article on country experiences from India.

Nepal has adopted a new road maintenance regime through the establishment of a dedicated roads fund and the Roads Board Nepal for the management and operation of the fund. The second article on country experiences discusses the management and operational aspects of the Board

and experiences gained from its first two years operating the fund. Experience from Nepal suggests that reforms in road maintenance have substantially improved the availability of finance for road maintenance and the condition of its road network. The article also discusses issues that require urgent attention. These issues include institutional problems concerning management and utilization of the funds generated and capacity constraints in road agencies that implement the actual maintenance works.

As in many other countries, underfinancing of road maintenance had been a major problem in Pakistan. In order to address this problem, the Government of Pakistan has started an off-budget financing arrangement by establishing a road fund called Road Maintenance Account. The National Highway Authority has introduced a fee-for-service concept on national highways. Toll revenues and receipts from all sources specifically earmarked for highway maintenance are channelled through the road fund. The article describes the management and operational procedures of the road fund.

The last article is from sub-Saharan Africa. The road sector in the United Republic of Tanzania has undergone reforms with far-reaching effects. As a part of the reform process, the Roads Fund and the Roads Fund Board were established by an Act passed by the Parliament in 1998. The main functions of the Roads Fund Board are to collect and disburse funds and to monitor its utilization by road agencies. The Board has made a number of improvements including increasing revenue collection and ensuring a stable and regular flow of funds. The article focuses on the experience of operating the fund.

Interesting experiences relating to road maintenance financing from a number of countries all over the world are shared in this volume. They also discuss important policy issues related to improvement of road maintenance financing. It is expected that the articles will generate further debate on issues that have been discussed and increase awareness of the policy implications and responses. It is also expected that the articles will increase awareness in countries of the region about the benefits of establishing a dedicated financing mechanism for road maintenance and encourage policymakers to learn from good practices in other countries.

The *Bulletin* welcomes analytical articles on topics that are currently at the forefront of transport infrastructure development and services in the region and on policy analysis and best practices. Articles should be based on original research and should have analytical depth. Empirically based articles should emphasize policy implications emerging from the analysis. Book reviews are also welcome. See the inside back cover for guidelines on contributing articles.

Manuscripts should be addressed to:

The Editor
Transport and Communications Bulletin for Asia and the Pacific
Transport and Tourism Division, ESCAP
United Nations Building
Rajadamnern Nok Avenue
Bangkok 10200, Thailand

Fax: (662) 288 1000; (662) 280 6042, (662) 288 3050
E-mail: cable.unescap@un.org; quium.unescap@un.org

TRANSPORT AND COMMUNICATIONS BULLETIN FOR ASIA AND THE PACIFIC NO. 75

CONTENTS

		Page
Editorial statement		iii
Gunter Zietlow	Road funds: sustainable financing and management of Latin America's Roads	1
Stephen Brushett	Experience in reforms of road maintenance financing and management in sub-Saharan Africa	25
D.P. Gupta	Road funds: A case study of sustainable road maintenance in India	45
Dipak Nath Chalise	Roads Board Nepal: A sustainable approach to road maintenance management	59
Major Gen. Farrukh Javed	Sustainable financing for the maintenance of Pakistan's Highways	83
J.O. Haule	Financing roads in the United Republic of Tanzania: Challenges and strategies	97

ROAD FUNDS: SUSTAINABLE FINANCING AND MANAGEMENT OF LATIN AMERICA'S ROADS

Gunter Zietlow*

ABSTRACT

The extensive road networks of Latin America and the Caribbean, valued at over US$ 350 billion, show alarming signs of neglect and decay. It is estimated that more than US$ 30 billion are wasted annually in the absence of adequate road maintenance. Individual countries in the region are losing 1 to 3 per cent of their annual GNP from increase in vehicle operating costs and loss of road asset values alone.

Consequently, several countries in the region have started to place road maintenance on a fee-for-service basis and are transferring road maintenance management from a government environment to a company environment. A new generation of road maintenance funds has been created in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and in the four Brazilian states of Mato Grosso, Mato Grosso do Sul, Paraná, and Goiás. This article provides an overview for creating sustainable road maintenance funds as well as a discussion of the approaches taken by the aforementioned governments, the difficulties they encountered and finally the lessons that have been learned.

Keywords: Road funds in Latin America, Road maintenance financing.

INTRODUCTION

For the last 50 years, roads have been the backbone of Latin America's freight and passenger transport system with road networks continuing to grow rapidly throughout most of this period. However, in recent years the rate of expansion has slowed and ageing of road networks has proceeded rapidly (see figure 1). Scarcity of resources, especially in the 1980s, has contributed to an ever-decreasing amount of money allocated to road maintenance. Towards the end of the decade many countries in the region spent less than 20 per cent

* *German Agency for Technical Cooperation (GTZ); e-mail: Gunter.Zietlow@gtz.de.*

of the amount necessary to maintain their road networks in serviceable condition. In the early 1990s, funding levels for the road sector improved slightly. However, the available funds were mostly being used for road rehabilitation.[1] Only a small portion was being spent on the more cost-effective routine and periodic maintenance[2] activities. This situation remains unchanged in most of the countries of the region.

Figure 1. Examples of poor construction and maintenance of roads

Raising funds for road rehabilitation is much easier than for road maintenance. Loans to finance rehabilitation are more readily available from international donors, while road maintenance must compete with a myriad of domestic spending priorities. Generally, 2-3 per cent of the new investment value of a road network is required for its routine and periodic maintenance. Countries in the region spend only 20 to 50 per cent of this amount. In addition, the available funds are often used inefficiently.

---

[1] *Rehabilitation of paved roads is defined as selective repair and strengthening of the pavement or shoulder after partial demolition of the existing structure.*

[2] *Periodic maintenance is defined as surface treatment or surface renewal including regravelling.*

Road conditions in the region vary from country to country. However, generally only one third of the paved main road network is in good condition, one third in regular and one third in poor condition. The condition of unpaved roads is even worse. These conditions have not changed much over the last 10 years despite recent large-scale investment in road rehabilitation.

Past efforts to increase financing levels for road maintenance either failed or were not sustained. Equally unsuccessful were most of the efforts to improve the performance of the public road administrations in the region, which were mainly financed by multilateral or bilateral donors.

The main lessons learned are clear. An appropriate institutional arrangement for adequate financing and management of road maintenance can make a substantial improvement in road conditions. It is necessary to address the two main underlying causes related to financing mechanisms and institutional arrangements for road maintenance.

Cause number 1:

Experiences from nearly all developing and most developed countries reveal that it is impossible to secure an adequate and stable flow of funds for road maintenance through the general government budgetary allocation procedure, especially if the allocation depends on annual political budget debates.

Road maintenance is less politically attractive than new road construction, road rehabilitation, and social programmes which are more "visible" and therefore carry more political mileage. In addition, the lack of understanding regarding the economic consequences of poor maintenance, even by those administering the road network, further complicates efforts to raise sufficient maintenance funds. Globally very few countries, with Japan and some European countries as notable exceptions, have been able to assign sufficient resources to road maintenance on a sustainable basis.

Some countries in Latin America used to finance road construction, rehabilitation and maintenance through earmarked taxes, especially on fuels used by motor vehicles. However, none of these funds could be sustained in the long run. The main problem was that Governments began utilizing these funds for other purposes. This was especially true in times of crisis. As many of these crises were never resolved, dedicated road maintenance funds have effectively been permanently reallocated.

Cause number 2:

Rules and regulations of the public administration system do not allow for efficient management of road maintenance in spite of the good intentions of public employees responsible for road maintenance.

In Latin America and the Caribbean, government departments carry out the management of road infrastructure. While most of the construction, rehabilitation and some maintenance projects are contracted out, the government departments are responsible for planning, contracting, and supervising these projects in addition to performing most of the road maintenance works. Overstaffing, lack of discipline and control, lack of incentives and corruption are common problems in many of these departments. Internal inefficiencies of government departments also act as a major hindrance to sustainable road maintenance at a reasonable cost.

I. FINANCIAL REFORM OF ROAD MAINTENANCE

Probably the best way to secure an adequate and stable flow of funds without relying on taxes is to charge road users a road maintenance fee, also called a user charge, in exchange for the services of maintaining roads. In most countries, the financing of road maintenance through taxes has never worked satisfactorily and it would be at best misleading to assume that this will change for the better in future. Road maintenance can be treated as a public service similar to water supply, telephone and electricity services, where the user pays for the services received. To be able to do so, the following conditions must be met: the road user pays in relation to road usage and should receive adequate road maintenance services while those not using the road system are not required to pay. In addition to these criteria, the collection system should be easy and inexpensive to administer, yet difficult to evade.

The system that best suits these criteria is an electronic tolling system covering the whole road network. Each vehicle can thus be charged individually according to its usage of any particular road. Unfortunately, this kind of system is still in its infancy and is not expected to be in existence on a comprehensive scale in most of the developing countries in the near future. For the time being, a shadow toll system[3] may be considered, which mainly uses the consumption

[3] *This should not be confused with the shadow toll system used in the United Kingdom of Great Britain and Northern Ireland where the Government pays a fee to a concessionaire for the construction, operation and maintenance of a road.*

of motor fuels on roads as a "service meter" and reflects the usage of roads fairly well.[4] This implies that a service charge or road maintenance fee can be levied and collected together with the sale of motor fuels. The only disadvantage of collecting the fee in this manner is psychological, as most people consider fees added to motor fuels to be another tax[5] to finance general expenses of the government and not necessarily to provide road maintenance services. Therefore, it is extremely important to identify and clearly mark this charge as road maintenance fee and to collect the receipts in a separate fund, independent of any government, departmental or municipal funds, and make sure that the proceeds are used only for road maintenance.

The pump price of motor fuel may also contain a tax element to finance general government budget expenses, one of which can include construction and rehabilitation of roads. The pump price may also include a road maintenance fee which is to be deposited in a separate fund earmarked for road maintenance expenses (see figure 2).

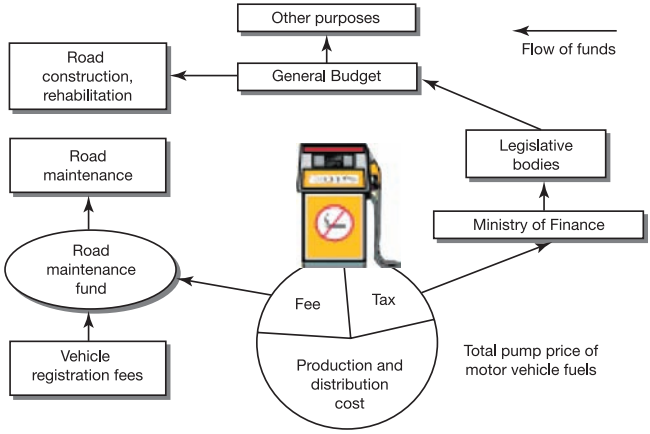


Figure 2. Use of funds collected from road users

[4] *Only heavy vehicles are an exception and require an additional charge to compensate for the greater usage of roads due to relatively higher axle loads. In New Zealand and in some of the States of the United States of America weight-distance charges are applied to heavy vehicles. These charges are not recommended for use in developing countries, since they are difficult to administer and fairly easy to evade in the absence of a strict control system.*

[5] *Officials from the Ministry of Finance often argue that this is an earmarking of taxes. There is a very clear cut distinction between taxes and service charges. Taxes are defined by law, do not bear a direct relationship between source and destination of funds, and are collected by governments. Service charges are directly related to the services provided, cover their cost, and are collected by the entity that provides the services. Principally, taxes serve to finance public services that do not generate sufficient income to finance themselves, like basic education and health services, public administration or defense. In contrast, road maintenance services can easily be financed through user charges.*

Because motor fuels are consumed on all roads, all roads should receive funds from the road maintenance funds including interurban, urban and rural roads. To what extent maintenance costs should be reimbursed by the fund remains a central question. This issue is especially relevant for roads with very low traffic, as the road maintenance fee "collected" for these roads would be far below the funds required for maintaining them. Most likely, the road maintenance fund will have to contribute more than collected from the motor fuels consumed on these roads. The actual amounts could be tied to a number of criteria or simply to a flat rate per kilometre. Fixing these amounts could be part of the decision-making process of the fund management, in which the road users should also have a stake.

Since one of the conditions of a road maintenance fee is that only road users should pay for road maintenance services, the issue of diesel not used on roads remains to be resolved. There are several options for dealing with this problem. One possibility is to chemically differentiate between the two diesels by colouring the one not used in road vehicles. This method is being used in many developed countries and requires either a good control system or very disciplined road users. Another possibility is to rebate the amount of the road maintenance fee to those not using the diesel in road vehicles. This is fairly easy to handle in the case of power stations and others using large quantities of diesel. However, it is almost impossible to administer such a scheme for small-scale users, such as farmers. In this case, other methods of compensation could be applied, such as assigning more maintenance funds to farm roads than would be justified under normal road maintenance cost allocation systems for these roads.

Analysis of road maintenance costs in several Latin American countries suggests that US$ 0.07 to US$ 0.09 per litre of motor fuel would be required to cover the cost of maintaining a country's entire road network, assuming motor fuels were the only source of road maintenance funding and the existing roads were in a maintainable condition. For most countries this means that large sections of their road networks would require rehabilitation before they would be eligible to receive funds from the road maintenance fund. If additional road maintenance fees for heavy vehicles were applied, the fees raised from motor fuels could be reduced accordingly.

Road tolls are an alternate system for collecting fees for road maintenance. Unfortunately, the cost of operating a toll system is high. Only for roads with more than 1,500 vehicles per day do the collection costs stay within a reasonable range of 10 to 30 per cent of the tolls collected, depending on the amount of the toll and the volume of traffic. As such, this type of system

is economically viable for only a small percentage of roads, probably less than 5 per cent of all roads in Latin America. This is a clear indication that tolling systems would be a poor method for financing a country's whole road network. Tolls could augment other user fees designed to cover road maintenance costs but would result in double charging (tolls plus road maintenance fees) and therefore are not recommended for this purpose. Tolls on toll roads should preferably be used to recover construction or rehabilitation costs while maintenance costs should be reimbursed by the road maintenance fund.

It is difficult to convince road users to pay an additional road maintenance fee. They would argue that the government receives enough funds from taxes on motor fuels, motor vehicle, licensing fees and other fees to cover the cost of road construction, rehabilitation and maintenance. It is potentially just as difficult to persuade governments to hand over a part of "their" taxes for regular maintenance purposes.

Resistance to paying maintenance fees stems from the lack of recognition that road users face the consequences of poor road conditions in the form of higher vehicle operating costs. It is estimated that investing one third of the additional vehicle operating costs now spent due to bad roads on road maintenance would save the road user the other two thirds (see table 1). If they knew what could be saved by paying road maintenance fees, most road users would be willing to pay, even if this would mean an increase in fuel and other vehicle related taxes. However, willingness to pay would likely be subject to credible assurances that the funds raised through fees would only be used for road maintenance. When users fees are applied to fuel, governments are frequently willing to reduce fuel taxes by a corresponding amount. In these cases, the price of fuel at the pump may not change significantly.

Table 1. Savings effected by paying road user fees in El Salvador

Cost element [a]	Passenger car (US dollars per 100 km)	Heavy truck (US dollars per 100 km)
Vehicle operating costs driving on bad roads	14	64
Vehicle operating costs driving on good roads	10.5	52
Savings in vehicle operating costs	3.5	12
Equivalent road user charges	-1.0	-3.5
Resulting savings	2.5	8.5

[a] Vehicle operating cost on asphalt concrete roads in hilly terrain (2000).

II. INSTITUTIONAL REFORM OF ROAD MAINTENANCE

A relevant question is how we can safeguard public interest by maintaining good road conditions. In most developing countries, public sector road organizations and their respective ministries are responsible for keeping road networks in good condition. They are not directly accountable to road users and do not face any real consequences for failing to ensure proper maintenance of road networks. Often, they do not even know the condition of roads under their jurisdiction, much less the asset value of the roads or whether road asset value is increasing or decreasing. Any commercial enterprise that neglects its assets, as governments often do, would go out of business.

Road users are the ones who actually have to bear the consequences of poor road maintenance. Therefore, they have a direct interest in maintaining good road conditions and should have more direct control over road maintenance spending. One way of achieving such control is to create road maintenance boards, with complete financial, administrative and technical autonomy and with active participation of road users and other stakeholders. Depending on the size of the country, there might be either subsidiary or independent local road maintenance boards for the different categories of roads and/or road administration districts. The principal functions of such road boards should include:

(a) Proposing the levels of road maintenance fees;

(b) Administering and managing the Road Maintenance Fund;

(c) Contracting the planning, execution and supervision of road maintenance;

(d) Safeguarding investments made in roads;

(e) Informing the public periodically on the effectiveness and efficiency of road maintenance spending.

Road boards exist in various countries around the world, with either executive functions, such as in New Zealand (Dunlop 1996), Zambia (Jhala 1995) and Honduras, or advisory functions, as in Japan, the United Republic of Tanzania (Heggie and Vickers 1998) and Guatemala. Based upon the positive and negative experience gained from road boards/funds worldwide, certain design criteria can be established which might help to create sustainable road maintenance boards/funds. These criteria include the following:

(a) The directors of the board should represent the relevant interest groups, especially road users;

(b) The board should be autonomous with a firm legal basis;

(c) The fees should reflect the usage of roads, should be adjustable according to needs, should be collected by the board and deposited into a road maintenance fund account, and should be used primarily for road maintenance (routine and periodic maintenance, including strengthening of pavements and regravelling).

In order to be effective, the road maintenance board/fund has to channel and control funds to other agencies, corporations or companies for planning, executing and supervising road maintenance works. Depending on the structure of road administration in a specific country, a road maintenance board can operate in a number of ways. The principal decision to be taken by an executive board is whether or not it is going to contract out work directly or whether it wants to make use of an existing road administration or agency. The more effective and efficient the existing organizations are, the more likely they are to be given a major role. If an efficient road agency or corporation exists, a performance contract between the agency and the board might be the best choice (see figure 3). In the case of an existing road administration, the board might also decide to contract out maintenance works directly, while making use of the planning and contract preparation skills of the road administration.

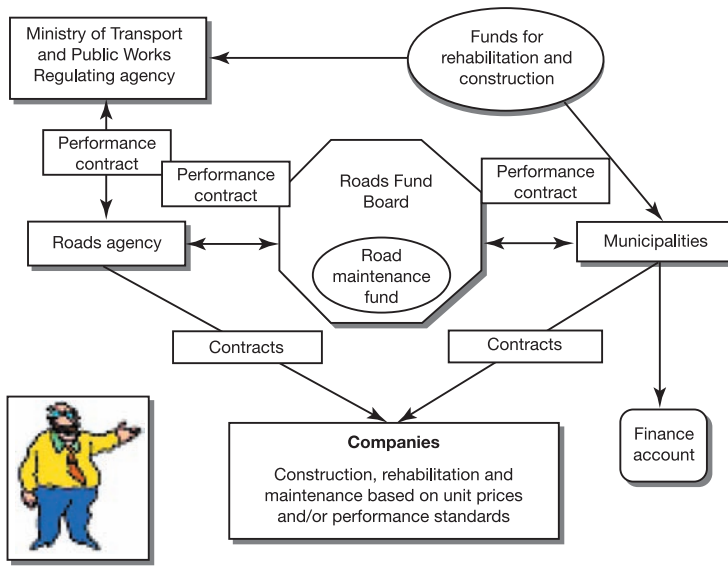


Figure 3. Road maintenance works through existing agencies

One administrative arrangement could be for the road maintenance board to contract all road maintenance to companies tasked with maintaining roads to a certain standard in a specific area on a long-term basis (see figure 4). For smaller countries, having one national road maintenance board may be sufficient; for larger countries however, creating provincial and municipal boards may be a better solution.

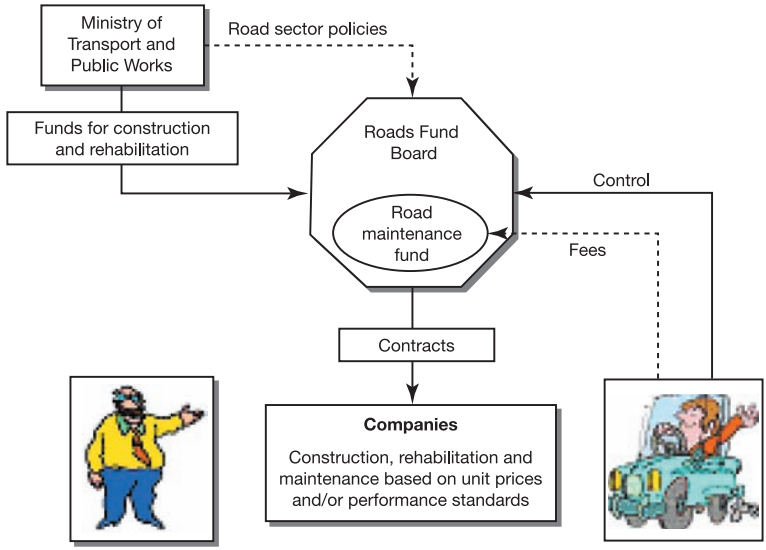


Figure 4. Outsourcing road maintenance works

One question remains: who is going to contract and pay for road construction, rehabilitation and major improvements? As long as government bodies are receiving motor fuel taxes, it seems fair that they should continue to finance these works and either contract them directly or let the road maintenance board(s) contract the work on their behalf. The second solution might have the advantage of better ensuring that the quality of road design and construction suits road maintenance needs.

III. THE REFORM PROCESS

To change the present tax-based financing of road maintenance system to a fee-for-service approach will require the broad support of road users as well as the approval of the government and politicians in control of the legislative bodies. The easiest way to convince people to accept these changes is to clearly demonstrate the advantages that they would receive from doing so.

This does not seem to be too difficult in this case as the road users will save more on vehicle operating costs than they will have to spend on additional road maintenance fee. The government and taxpayers will also benefit as they have to bear a lesser burden for future road rehabilitation.

Another important aspect in wining public support is to give road users control over where and how to spend the road user levies collected for the road maintenance fund. A few influential people might have something to lose from introducing the new charging system. These are the people who abuse the current system to favour political allies and personal friends, which would certainly be more difficult to do in a more transparent system controlled by road users. Therefore, awareness-building, orientation and organization of direct and indirect road users are essential for implementing such a reform in the road sector. Typical groups to involve in this process includes passenger and freight transport organizations; automobile associations; farmers' associations; chambers of commerce and industry and road associations.

Often the question arises as to whether or not to include the financing of road rehabilitation in such a financial scheme. This depends on whether users are willing to pay for rehabilitation in addition to maintenance. Users might argue that road rehabilitation is necessary only because the Government did not maintain the roads in the first place, and thus will be reluctant to pay in the form of user fees. As long as governments find enough funds, or are pressed by road users to do so, road users might succeed with this line of argument. However, if governments are not able to mobilize enough resources of their own, the necessary funding for rehabilitation will have to be arranged from external bilateral and multilateral donor agencies, or road users will have to allow for such costs to be covered by road maintenance fees. Since many countries are faced with a high percentage of poorly maintained roads, rehabilitation must be completed before regular maintenance can take place. Therefore, it might be necessary for some Governments to temporarily fund road rehabilitation through this financing mechanism as well. This, of course, will be reflected in the fee levels, which for inflationary reasons should rise gradually.

The concept developed by the Economic Commission for Latin America and the Caribbean (ECLAC) was instrumental for road maintenance reform to take shape in Latin America and the Caribbean. The dissemination of this concept throughout the region, as well as a favourable reform climate in the 1990s, encouraged many countries to consider and adopt such reforms. In 1993, the International Road Federation, ECLAC, the World Bank and the Pan American Institute of Highways joined forces in organizing a series of regional

Box 1. Membership and characteristics of some road fund boards in Latin America

Road Maintenance Fund of Honduras

- The Board has executive functions and consists of seven members: three ministers or vice ministers (Transport and Public Works, Finance, and Economy), the Director of Roads of the Ministry of Transport and Public Works, one representative of the Association of Municipalities, and three from the private sector (Chamber of Commerce, Association of Transport Enterprises, and College of Engineers).
- The Minister of Transport and Public Works is the chairman of the Board and appoints the representatives of the private sector upon nomination by organizations.
- The Board contracts out all execution and supervision of road maintenance to the private sector and uses the Ministry of Transport and Works for planning purposes.

Road Maintenance Fund of Guatemala

- The Board has some executive functions and consists of six members: two ministers or vice ministers (Transport/Public Works and Finance), the Director of Roads of the Ministry of Transport and Public Works, one representative from the Road Transport Association, one representative of the Chamber of the Construction Industry, and one representative of the Chamber of Agriculture.
- The Minister of Transport and Public Works is the chairman of the Board and appoints the representatives of the private sector upon nomination by the organizations they represent.
- The Board contracts out all execution and supervision of road maintenance to the private sector.

Road Maintenance Fund of the state of Paraná (Brazil)

- The Board has executive functions and consists of 16 members: three Secretaries of State (Transport/Infrastructure, Industry/Commerce, and Agriculture), the Director-General of Public Works, one representative from Parliament, one representative from the municipalities, and

(continued to page 13)

(continued from page 12)

10 representatives from the private sector (Agricultural Federation, Federation of Industries, Federation of Freight Transport Enterprises, Federation of Passenger Transport Enterprises, Chamber of Commerce, Transport Syndicate, Syndicate of Transport Related Services, Federation of Agricultural Workers, Syndicate of Freight Transport Enterprises, and a representative for road users selected by the Consumer Protection Agency).

- The Chairman of the Board is the Secretary of Transport.
- The Board contracts out all execution and supervision of road maintenance to the private sector.

and national seminars on improving the highway system in Latin America and the Caribbean under the name PROVIAL. The financial and institutional reform of road maintenance was the main theme of these seminars. After several countries expressed interest in such reforms, the International Road Federation and the German Agency for Technical Cooperation (GTZ) initiated a project in 1994 to assist the countries in creating their road maintenance funds and contracting out road maintenance by performance standards.

IV. CASE STUDIES ON ROAD FUNDS IN LATIN AMERICA AND THE CARIBBEAN

So far, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and four states in Brazil have created road maintenance boards to oversee road maintenance funds. Each country is faced with a unique set of challenges and therefore must shape its policy accordingly. All of the countries are able to do this while more or less adhering to the principles of the reforn measures. Table 2 summarizes the characteristics of road funds in Latin America.

Honduras

In Honduras, legislation to create the road maintenance fund was passed in 1993. A Board consisting of four representatives from the central Government, one representative from the municipalities and three representatives of direct and indirect road users are supervising the fund. The principal financial source of the fund is a levy on motor vehicle fuels in the form of a dedicated tax. The road maintenance fund is used for the routine and

Table 2. Characteristics of road funds in Latin America (2001)

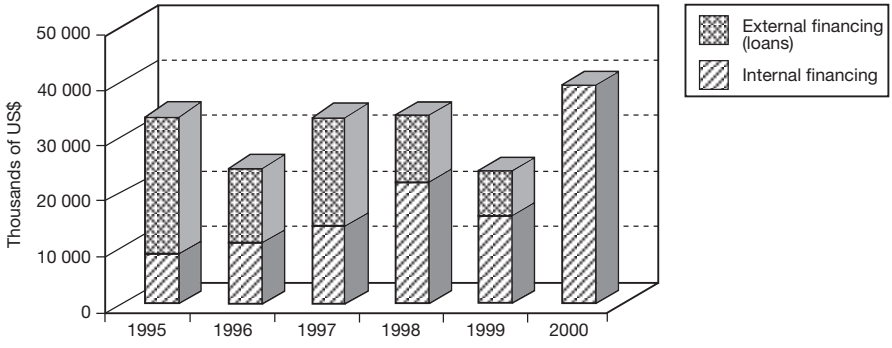
Country and date of creation		Main sources of income	Fuel levy in US cents per litre of gasoline-diesel	Percentage of fuel levy of total income	Composition of Board (public-parliamentary-private)
Costa Rica April 1998		Fuel levy	7.5-4.3 25 per cent for local road fund	95	4-0-3
Guatemala February 1997		Fuel levy	3.1-3.1	100	3-0-3
Honduras January 1999		Fuel levy	8.2-2.6	100	4-0-3
Nicaragua June 2000		Federal budget	–	–	3-0-3
El Salvador November 2000		Fuel levy	5.3-5.3	100	2-0-5
Brazil	State of Mato Grosso do Sul August 1999	Fuel levy and taxes on agricultural goods	0.4-0.8	50	5-1-2
	State of Mato Grosso March 2000	Fuel levy and taxes on agricultural goods	1.5-1.5	17	7-0-0
	State of Paraná December 2000	Fuel levy	0.4-0.8	100	6-1-9
	State of Goiás January 2001	Vehicle licensing fee	–	–	3-1-6

periodic maintenance of the official road network, excluding urban and municipal roads. Up to 10 per cent of the fund can be disbursed for road rehabilitation works. All works as well as services have to be contracted out to the private sector. In addition, to avoid creating another bureaucracy, the administrative cost of the fund has been restricted to 2.5 per cent of its annual budget. Currently, the Road Maintenance Fund has 38 staff members including the supporting staff.

Unfortunately, a law that was originally created by an outgoing government stipulated that all proceeds from taxes related to road transport, such as fuel taxes, import duties on motor vehicles and licensing fees, would form the income of the Road Maintenance Fund.

However, this was not acceptable to the new government. In addition, the proceeds from all these sources would have provided twice the funds needed for road maintenance. This issue was solved in 1999 through an amendment to the law stipulating that only a specific portion of the fuel tax would be dedicated to the Road Maintenance Fund.

The actual operation of the Road Maintenance Fund started in January 2000. Since then, the level of financing has remained stable and road maintenance is done almost exclusively through resources from the Road Maintenance Fund (see figure 5). The projected income of the fund for 2009 is US$ 84 million (using the exchange rate for 2000). The coverage of the road network maintained by the Road Maintenance Fund will increase from 34 per cent in 2001 to 100 per cent of the whole road network of 14,602 km in 2009. These projections are based on the assumption that the Government will assign 100 per cent of the dedicated taxes to the Road Maintenance Fund. Until now, the Government was withholding between 22 and 45 per cent of the dedicated fuel tax, citing urgent needs for other services. This again clearly underlines the need to make the financing of the Road Maintenance Funds completely independent from government interference.



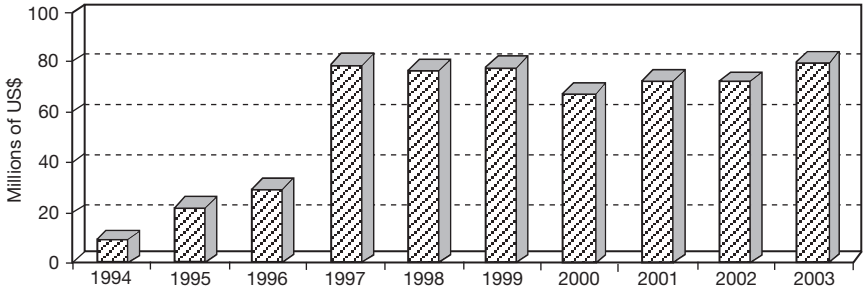
Source: Road Maintenance Fund, Honduras.

Figure 5. Flow of funds for road maintenance in Honduras

Guatemala

Guatemala passed a law in 1996 increasing the taxes on motor fuel and dedicating this increase and part of the existing fuel taxes to a special fund to be disbursed exclusively for road maintenance and improvement. The body governing this fund was created by a government decree in early 1997. Three members of its Board are government officials and three members are from the private sector. As in the case of Honduras, all works and services have to be contracted out to the private sector. The administrative cost of the Fund has been limited to 2 per cent of its annual turnover. The original intent by the Minister of Transport to create an autonomous Road Maintenance Fund had to be abandoned, as its approval required a two-thirds majority in the parliament, which the Government was unable to secure.

With the introduction of the Road Maintenance Fund (COVIAL), funds spent on road maintenance jumped from US$ 29.5 million in 1996 to US$ 72.6 million in 2002 (see figure 6).

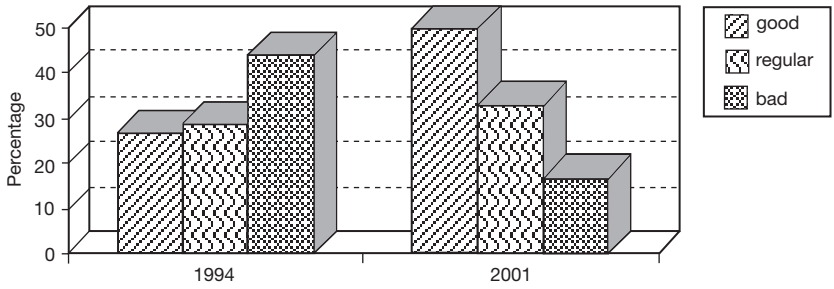


Source: COVIAL.

Figure 6. Financial resources spent on road maintenance in Guatemala

While in 1994 only 11 per cent of the 11,100 km road network received maintenance services, that figure had increased to 49 per cent of 14,340 km by 1999. Priority was given to paved roads, which received almost 100 per cent coverage. The condition of the paved roads has improved substantially since 1997 (see figure 7). However, this was partly due to road rehabilitation projects funded by government and external lending agencies, and not from the Road Maintenance Fund.

Until the end of 1999, the Road Maintenance Fund worked very effectively, creating a very favourable perception among the general public. The



Source: COVIAL.

Figure 7. Road conditions of the paved roads in Guatemala in 1994 and 2001

most notable improvement was the disappearance of potholes, which had annoyed road users. In 2000, a new Government assumed power and the performance of the Fund dropped considerably. Political influence and frequent changes of the director of COVIAL made effective and efficient operation of the Road Maintenance Fund difficult.

Illegal procurement procedures initiated by politically appointed members were rejected by the board members from the private sector. Consequently, there was an attempt to reassign the funds dedicated to COVIAL to another fund, which the Government had more control over. This attempt was abandoned due to intervention by the World Bank, the Inter-American Bank and GTZ.

Costa Rica

Costa Rica created its National Road Fund in 1998. The Fund's main source of income is a fuel levy. The fund takes care of the maintenance, rehabilitation and improvement of the national road network. Priority in funding is given to routine and periodic maintenance. The Board has three members from the central Government (all from the Ministry of Public Works and Transport), one member representing the municipalities and three members from the private sector. The private sector representatives are nominated by their respective organizations. As in the cases of Honduras and Guatemala, the Fund is obliged to contract out all works and services to the private sector. Unfortunately, the fund has to abide by government rules concerning wages and letting of contracts, which may have negative effects on its efficiency.

In its first two years of operation, the National Road Fund did not receive the full amount of funding it was supposed to under the road fund law, with more than 30 per cent of its funding being withheld until the year 2000. This underlines once more the necessity of depositing funds directly into a road fund account instead of channelling them through the government.

In order to improve the financial base of the National Road Fund, the Government dedicated funds to a municipal road fund and passed a new law in July 2001 assigning 30 per cent of fuel taxes to the road sector, out of which 75 per cent goes to national roads and 25 per cent to municipal roads. For 2003, the total amount to be collected for the two road funds was estimated to be equivalent to US$ 130 million. The municipalities were receiving funds on the basis of a formula that included the length of their road network among other factors and were required to have matching funds from their own sources.

Nicaragua

In June 2000, Nicaragua passed a law creating its Road Maintenance Fund, an autonomous body governed by a board. The board has two members representing the national Government, one representing local governments, and three representing direct and indirect road users. The Road Maintenance Fund is responsible for the periodic and routine maintenance of the national road network, which includes a major part of the rural roads in Nicaragua. In addition, up to 10 per cent of the Fund's annual budget can be spent on minor rehabilitation works.

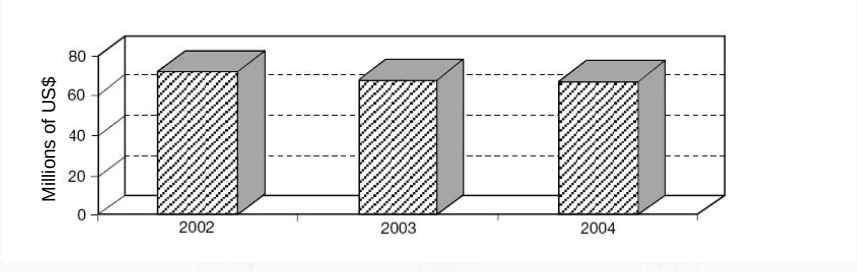
As in the three countries mentioned above, all works and services must be contracted out to the private sector. Besides having internal audits, the Fund is audited annually by an independent auditor. In addition, it is planned to regularly inform road users about the Fund's performance.

In order to win public support, the Government initiated an extensive public awareness campaign prior to creating the Road Maintenance Fund and decided not to increase fuel prices in the initial stage of creating the Fund. To provide the initial funding, it was proposed that a part of the existing fuel taxes would be converted to a dedicated fuel tax. Ultimately this measure was not approved due to objections raised by the Ministry of Finance. This left the financing of the Road Maintenance Fund to the Government's normal budgetary process. The Road Maintenance Fund continues to be financed through the general budget. This has left it under-financed and unable to maintain the national road network to high standards.

El Salvador

El Salvador created its Road Maintenance Fund in November 2000. It is an autonomous body supervised by a board having two members from the central Government, three members representing indirect road users, and two members representing direct road users.

The Road Maintenance Fund (FOVIAL) is responsible for maintaining the national road network. A fuel levy of US$ 0.20 per litre was written into law in November 2001. FOVIAL has enjoyed a stable budget since then (see figure 8).



Source: FOVIAL.

Figure 8. Income of FOVIAL

FOVIAL has received 100 per cent of the dedicated fuel taxes, making it an exception among Central America's road maintenance funds. FOVIAL seems to be the most effective and efficient Road Maintenance Fund in Central America, covering 100 per cent of the paved national road network and 96 per cent of unpaved national roads, totalling 5,390 km in 2003.

FOVIAL is managed by a small staff of 29 persons (see figure 9) tasked with contracting all works and services to the private sector.

An excellent public relations programme is another impressive achievement of FOVIAL. Besides using the Internet to inform road users on the condition of the roads and the works being undertaken, there are daily news releases as well as daily advertisements in the major newspapers informing the public on the road works undertaken by FOVIAL and the benefit of such works.

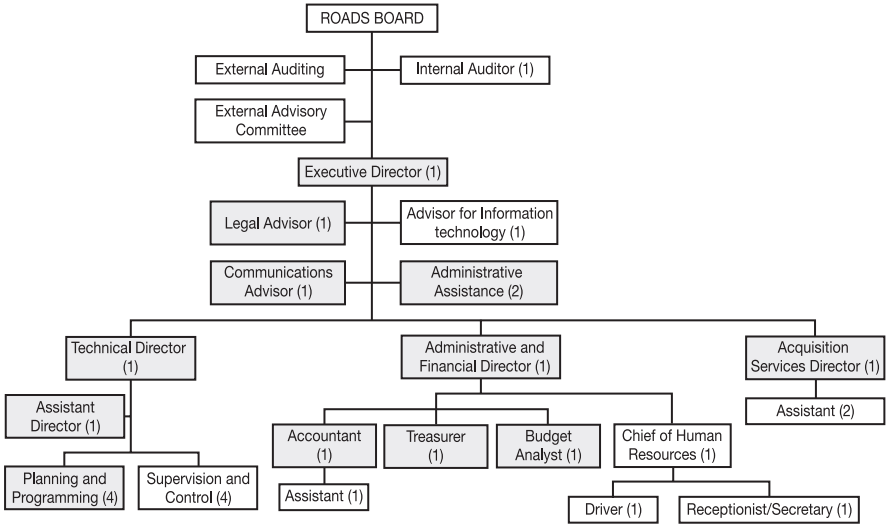


Figure 9. Organization chart of FOVIAL

Brazil

Four Brazilian states have created autonomous road funds – Mato Grosso in June 1999, Mato Grosso do Sul in March 2000, Paraná in December 2000 and Goiás in January 2001.

The road funds in the Mato Grosso and Mato Grosso do Sul have similar characteristics. Both states have boards with a majority of members coming from the public sector and finance the fund through a levy on motor vehicle fuels and agricultural goods. The boards are responsible for construction, rehabilitation and maintenance of roads. Since both states were predominantly agricultural and needed to expand their road networks, it was deemed necessary to include road construction and rehabilitation as well. In order to meet the additional financial requirements for road construction and rehabilitation, the financial base of the road fund was broadened through levies on agricultural goods.

The road fund in Paraná is a more traditional road maintenance fund. Funding is provided exclusively by a levy on motor vehicle fuels. The board consists of 2 representatives of the state government, 1 representative of the parliament, 1 representative of the municipalities, and 10 representatives of direct and indirect road users. In Goiás, the Road Fund is financed through vehicle licensing fees. The board concentrates on road maintenance, and the majority of its members are from the private sector.

Several other states in Brazil are in the process of creating similar Road Funds. At the federal level, the parliament amended the constitution in December 2001 to permit the dedication of some of the fuel taxes for transport purposes. The corresponding law was passed at the same time but has not yet taken effect. The major portion of the approximately US$ 3 billion in dedicated fuel taxes would most likely go to the road sector. As a preliminary measure, US$ 120 million was assigned to the federal states for road maintenance in January 2004. Since then, the amount assigned by the Government to the federal states has increased substantially.

Other countries, such as Ecuador and Mexico, are discussing the creation of road maintenance funds but are still far from reaching a consensus. In Peru and Colombia, the initial progress towards establishing road maintenance funds has suffered major setbacks as Governments and their priorities have changed. Nevertheless, the urgency of reforming the inefficient financing mechanism and management of the road maintenance system in these countries is increasing.

In June 2003, the Committee of Transport Ministers of Central America formed a Subcommittee on Road Funds. This should enhance the exchange of information between the road funds in Central America and is expected to contribute to the stability and long-term survival of these funds. A similar initiative is being planned for the road funds in Brazil.

V. LESSONS LEARNED

Since Latin America's road maintenance funds have started operating fairly recently, it is too early to judge their performance or long-term sustainability. Nevertheless, some lessons can be drawn from the process of creating these funds.

A broad consensus among all stakeholders is an essential prerequisite for creating a road maintenance fund. In order to arrive at such a consensus, it is necessary:

(a) To create a forum for discussion by holding a series of seminars with officials at different levels of government; political parties and organizations representing direct and indirect road users, such as trucking associations, bus operators' associations, automobile associations, farmers' associations, and chambers of commerce and industry;

(b) To clearly demonstrate the economic consequences of poor road maintenance to all concerned parties. Generally, neither government nor road users are aware of the enormous economic consequences they face due to lack of proper road maintenance;

(c) To present government and road users with an attractive concept for reforming the finance and management of road maintenance. In order to obtain the agreement of road users, who will have to foot the bill, it is essential to give them some control over the funds to make sure that the money will be spent effectively and efficiently;

(d) To keep the public informed by means of a media campaign, including television and radio spots as well as newspaper articles. The public relations campaign needs to be maintained not only prior to creating a road maintenance fund but also during its operation.

It seems to be easier and faster to create road maintenance funds in smaller countries with poor road conditions than in larger countries with better roads. While the smaller countries in Central America were fairly quick to create such funds, larger countries such as Brazil, Colombia or Peru faced much greater difficulties in coming to a consensus.

Reliance on dedicated fuel taxes to finance road maintenance can put the sustainability of the dedicated fund at risk, especially if funds are to be channelled through the Government. In 1998, the Government of Guatemala had to fight off an initiative of the parliamentary opposition to divert the dedicated fuel tax to education. Since taxes form part of the general budget, governments and legislators often consider them to be resources that can be easily reassigned for other purposes. This situation changes if road user charges are legally defined as user fees. In addition, if proceeds are channelled through the Government, there is always a danger that funds will be diverted, even if this is against the law, as happened in Costa Rica and Honduras.

The creation of an autonomous road fund and the establishment of a fuel levy may require passing new laws. However, governments and parliaments are often reluctant to do so, especially close to upcoming elections. The best strategy seems to be to enact the new law(s) during the early days of a new administration, provided a broad consensus among all major stakeholders was reached during the preceding period, as was the case in Guatemala, Costa Rica and El Salvador.

As raising fuel prices are always a politically sensitive issue, increases in fuel levies should be gradual and in line with savings in vehicle operating costs gained from improved road conditions. This would also help to limit inflationary effects on economy. To ease the burden on road users at the beginning, consideration can be made to transform a portion of any existing fuel taxes into a fuel levy for road maintenance, as was the case in Guatemala. Road users often argue that they already pay enough fuel taxes and that the government should dedicate at least a portion of those taxes to road maintenance on a permanent basis.

Whether the road maintenance funds that had been established or are in the process of being established in Latin America will survive in the long run remains to be seen. The more a road maintenance fund follows the principles that help to make it sustainable, the greater the chances of its survival. But the funds are also very much dependent on the environment in which they operate. The political, economic and social stability of a country, as well as a well-established culture of citizen participation in public policy are essential for their long-term survival. It is the operating environment in many countries in Latin America that seems to pose the greatest challenge to existing and future road maintenance funds.

REFERENCES

Dunlop, R.J. 1996. "Roading agency of the future", paper prepared for the International Road Federation Asia-Pacific Regional Meeting, 17-22 November, Taipei. Available at <http://www.zietlow.com/docs/Srdnz.htm> (accessed 25 August 2005).

Heggie, I.G. and P. Vickers, 1998. "Commercial management and financing of roads", World Bank Technical Paper No. 409 (Washington, D.C., World Bank).

Jhala, R.A. 1998. "Involvement of road users in the management of roads: public private partinership: the Zambia Roads Board experience", paper presented at the workshop on road management and finance, 3-4 June, Kingston, Jamica. Available at <http://www.zietlow.com/docs/zambrf.htm> (accessed 25 August 2005).

EXPERIENCE IN REFORMS OF ROAD MAINTENANCE FINANCING AND MANAGEMENT IN SUB-SAHARAN AFRICA

Stephen Brushett*

ABSTRACT

The need to capture efficiency gains of modern business practice in road network management has been recognized in many countries. This is particularly relevant to sub-Saharan Africa in its efforts to address road deterioration due to constrained human and financial capacity. Progress has been achieved through improved policies and more appropriate management structures for roads since the early 1990s. The initial focus has been on road maintenance financing and addressing the deficits in this area. Some improvements have indeed been obtained in financing provision and service levels through road user charge related instruments. Experience suggests, however, that raising resources is not enough. More attention has to be paid to the overall effectiveness of road management. Efforts in this regard need to focus on four areas: creating efficient, autonomous agency structures to manage road programmes, strengthening government oversight capability, exploiting new technologies to reduce costs and utilizing performance-based approaches to contracting.

Keywords: Road management and financing, Road maintenance initiative, Road funds, Second generation road fund, Sub-Saharan Africa, Transport Policy Programme.

INTRODUCTION

High road expenditures as a reflection of the economic importance of roads

The public road network has been identified as the largest public infrastructure asset (Heggie and Vickers 1998). Estimation of road asset values,

* *Lead Transport Specialist, World Bank, Washington, D.C., United States of America.* *The findings, interpretation and conclusions expressed in this article are those of the author and do not necessarily reflect the views of the Board of Executive Directors of the World Bank or the Governments they represent or the World Bank.*

and costing out the implications of deferred maintenance to the economy and the road user, have given a strong impetus to asset preservation policies and maintenance prioritization. For sub-Saharan African countries this is a particularly important consideration as they generally carry higher road asset values per GDP than average. Thus the costs to economies of degraded networks are very high and constrain national economic development potential. For example, using Heggie's and Vickers' asset value estimates, and year 2000 GDP data from the World Bank, it is found that Ghana's ratio of asset value to GDP is 33 per cent and for South Africa it is 16 per cent compared with the following examples from other regions: Chile 5 per cent; Thailand 8 per cent, and Jordan 10 per cent.

The predominance of road transport as the principal means of passenger and freight movements – averaging 80 per cent worldwide, and generally higher than 60 per cent in sub-Saharan Africa – underlines the economic importance of roads. Growth rates of road networks have accelerated, particularly in transition and developing countries, which have sought to respond to increasing demand. Expansion has been particularly fast in Asia and Latin America, but somewhat lagging in sub-Saharan Africa. The investment implications are significant. Fay and Yepes (2003) estimate that needed yearly infrastructure expenditure in developing countries is around US$ 233 billion with a similar amount required for maintenance, approximating about 5.5 per cent of GDP in total. On average, roads are projected to require about 19 per cent of all infrastructure investment needs, or up to 1 per cent of GDP, to which allowance for current maintenance has to be added. For sub-Saharan Africa the numbers will be generally higher in view of past underinvestment and the accumulation of arrears on maintenance. For example, recent World Bank reports cite annual road sector expenditure as a percentage of GDP amounting to 2.2 to 2.5 per cent in Malawi (World Bank 2001) and 1.9 per cent in Zambia (World Bank 1997) in neither case was this regarded as sufficient to meet all needs.

Raising the finance that is needed

In recent years, greater attention has been paid to diversifying the sources of financing for road investment and maintenance. In this regard, recourse to private financing options is seen to be important. However, experience suggests that there are limits to the extent that public financing can be replaced. The fact of the matter is that in most regions of the world only a fraction of road networks can be fully funded by toll revenues raised either directly or indirectly. For Latin America, Fay and Yepes estimated that at best, private funding could cover 30 per cent of infrastructure investment needs. In

sub-Saharan Africa the situation is generally less favourable because of lower levels of traffic and, with the notable exception of South Africa, the prospects of raising substantial private financing are few and far between.

Therefore, the challenge of providing increased funding to the sector when traditional sources, especially those from direct budget allocations, are under increasing pressure from competing end uses remains. In nearly all regions, it has become necessary to find ways to improve resource inflows through various forms of off-budget financing, and to improve the effectiveness of the management of these funds. A number of countries such as Sweden, the United Kingdom of Great Britain and Northern Ireland, Finland and New Zealand have began to lead the way towards commercialising road management, managing roads as the big business that they indeed are. However, as pointed out by Heggie (2003) not all of these experiences may be directly transferable to developing countries. Nevertheless, over the last decade, great progress has been made in revamping road sector institutional arrangements, and creating new sources of funding that tap directly into user demands for increased expenditure. This progress is particularly evident in sub-Saharan Africa.

I. AFRICA'S ROADS PREDICAMENT: LOSING ROAD ASSETS

Road deterioration, and the subsequent loss of road assets, started to receive serious attention in the 1980s. As stated by Harral and Faiz (1988), "failure to maintain roads is tantamount to an act of disinvestment, for it implies the sacrifice of past investments in roads." Their study identified that the loss of approximately US$ 45 billion in road infrastructure in the 1970s and 1980s could have been averted by spending just US$ 12 billion on preventive maintenance. Crucially, they also drew attention to the inadequacies of traditional road management structures and functions in coping with the scale of the maintenance problem. They also made important contributions in focusing external support, including World Bank lending, on road maintenance and on setting up appropriate and adequately funded road maintenance organizations.

At this time it could fairly be stated that road maintenance in sub-Saharan Africa was as problematic as in any region. Heggie (2003) estimated that less than half of the required expenditure to prevent further deterioration was being met and that the required increases were on average 0.85 per cent of GDP. On average the quality of main road networks was extremely low, with not less than 25 per cent of paved and 33 per cent of

unpaved roads in poor condition. These road conditions led to higher vehicle operating costs and lengthier travel times. The situation was even worse for feeder road networks, with about 90 per cent of roads in poor condition, heavily penalizing agricultural production and the rural poor. Despite the allocation of a significant proportion of public resources, 5 to 10 per cent of recurrent budgets and 10 to 20 per cent of development budgets, the capacity to absorb and efficiently utilize these funds was very low. The combination of these factors was contributing to a substantial degree of frustration on the part of road users and other beneficiaries, as well as disenchantment among financiers.

II. NEW APPROACHES TO RESOLVE THE PROBLEMS

Clearly the time was right to try to address the problem before it became unmanageable, and before the negative economic consequences for regional economies became overwhelming. Fortunately, African countries, with assistance form the Economic Commission for Africa (ECA), the World Bank and a number of donor nations, were developing the sub-Saharan Africa Transport Policy Programme (SSATP). The SSATP was intended to act as a framework to address critical policy issues for improving transport in sub-Saharan Africa. The SSATP was launched in 1987[1] with addressing road maintenance policies as one of its first priorities, and help put road maintenance on the path to long-term sustainability. This was the objective of the Road Maintenance Initiative (RMI), a major component of the SSATP. The RMI commenced with a diagnostic phase and then branched out into a second phase of country-level initiatives in nine target countries.

This work permitted the identification of a wide array of problems contributing to poor road maintenance policies and practices. It subsequently led to the development of a reform agenda, the implementation of which started in the early 1990s. The driving philosophy behind this agenda was to manage roads on a more business-like basis, in particular, to charge for road use on a fee-for-service basis.

The framework for bringing about the necessary changes involved four "building blocks":

Ownership	Involve road users in the management of roads
Financing	Secure a stable flow of funds for adequate road maintenance

[1] *The SSATP was created in response to the perceived failure of the first United Nations Transport and Communications Decade for Africa (UNTACDA I) to generate clear developmental improvements. This failure was largely attributed to poor transport policy frameworks and implementation.*

Responsibility Ensure all parties know their responsibilities and are given corresponding authority

Management Introduce sound business practices and managerial accountability

III. CONTRIBUTION OF THE ROAD MANAGEMENT INITIATIVE – BUILDING THE PARTNERSHIP

RMI has always operated as a partnership, bringing together countries committed to road sector reforms with external donors and organizations who endorse these reforms. The name was changed to Road Management Initiative in 1997 (the acronym thus being unchanged) and in 2004 changed again to Road Management and Financing (RMF), to better reflect the broadening of the partnership. RMI and RMF have also actively pursued dialogue on road maintenance reforms with countries outside the original nine, and as a result, the number of partners increased to 13 by the end of 2000 and now numbers 19. Member countries include Angola, Burundi, Cameron, Chad, Ethiopia, Gabon, Ghana, Guinea, Kenya, Madagascar, Malawi, Mozambique, Niger, Senegal, the United Republic of Tanzania, Togo, Uganda, Zambia and Zimbabwe.

The RMI and RMF have pursued a broadly based programme from the start, as is evidenced by the record of publications since 1991.[2] Among the issues addressed are environment, contractor development, plant pool reform and road safety. While the key area of attention until now have been addressing the road maintenance funding deficit and management issues, RMF is expanding its agenda to complementary areas. It is hoped that through this expansion a more efficient use of resources generated for road maintenance can be achieved. This agenda covers improvement of the management of road maintenance systems and the execution of road maintenance by private contractors.

Key interlocutors for the RMI and RMF are regional associations of road funds and road agencies as well as the Regional Economic Communities (REC) in sub-Saharan Africa. Annual programmes of activities are defined with these regional associations. These activities are managed by a small team based in Washington, which is being progressively decentralized (one team member is based in Yaounde and two coordinators are being selected for posts in West and East Africa.

[2] *Can be seen at <www.worldbank.org/afr/ssatp>.*

IV. PROMOTING THE "SECOND GENERATION ROAD FUND"

The notion of a road fund was not a novel idea. As set out quite extensively in Heggie and Vickers, there were, and still are, a range of such funds in the developed world, notably in the United States of America and Japan. They also exist in quite a large number of transition and developing countries. The performance of such funds had, however, been mixed. Some of the common problems cited were: poor financial management; absence of independent audits; extensive use of funds for unauthorized expenditures; diversion of funds; and weak oversight. As a result, many of these earlier road funds, sometimes known as "first generation" road funds, have actually been closed down, very often at the express urging of the World Bank and IMF, notably in Europe and Central Asia (Georgia, Latvia, Romania and the Russian Federation, for example) but also in sub-Saharan Africa (Mali). A number of other "first generation" road funds in sub-Saharan Africa are under restructuring in an effort to address these problems (Gabon, Madagascar and Senegal, for example).

The road fund model championed by RMI was intended to address the above-mentioned historical weaknesses in a systematic manner, as well as to put into practice the aforementioned building blocks. Emerging from this process has been the so-called "second generation" road fund, of which there are now more than 20 in place or being established in sub-Saharan Africa. The key characteristics of these funds, as generally understood, are set out below:

- Sound legal basis – separate road fund administration, clear rules and regulations
- Strong oversight – broad-based private/public board
- Agency which is a purchaser not a provider of road maintenance services
- Sound financial management systems, lean efficient administrative structure
- Regular technical and financial audits
- Revenues incremental to the budget and coming from charges related to road use.

Much attention was given to convincing key development partners that the revised approach to road funds was not only viable but highly desirable in

terms of addressing the underlying weaknesses in road maintenance funding and the allocation of resources raised for this end. A particular focus has been on persuading IMF that such approaches could be reconciled with the concern, shared also by some ministries of finance in African countries, for maintaining a common, disciplined budget. IMF views on the acceptability of road funds, under certain conditions, are set out in Potter (1997).

IMF criteria in determining the acceptability of road funds include: a focus on dedicated road maintenance funding rather than on avoiding strict budget discipline; the separation of the purchaser function of the road fund agency from the road maintenance service provider; the presence of a management board with private sector participation but free from producer pressure; and the adoption of a robust financial management system to assure equal or better standards to those prevailing in central Government. Potter also underlined the desirability of a high level of cost recovery through road user charges, without necessarily excluding some level of continued government budgetary support.

In most of the countries where such funds have been created, the reaction has been largely positive. This is almost universally so among road users and the private sector, where the benefits have been demonstrable. In addition, key government ministries have largely seen the funds as positive. A good example of the perception of the reform's benefits, is contained in the presentation of the Chairman of the Zambia National Roads Board to the PIARC World Congress in Durban (Chipewo 2003). This presentation describes how perceptions of the maintenance problem, and what can be done to address it, have changed for the better over time.

V. MEASURING THE IMPACT OF ROAD FINANCING REFORMS

With the passage of time and the steady increase in the number of countries creating "second generation" funds, RMI paid increasing attention to reviewing the impacts of returns and has sought to validate some of the underlying assumptions and expectations relating to these reforms. Kumar (2000) carried out a detailed assessment of the road funds of five countries: Benin, Ethiopia, Ghana, Kenya and Zambia. The assessment primarily examined three areas: institutional and management structure; the process of setting up and implementing road funds and objective achievements. His analysis supported the view that incremental funding was being raised for road maintenance. He also noted that the road funds chosen for analysis were

generally doing a good job in managing resources and especially enhancing transparency in the use of these resources.

While it is difficult to empirically relate the creation of road funds to improved road conditions, a comparative evaluation of data in the above five countries indicates an increase in the length of "good" quality paved roads. In Zambia, the impact of road sector reforms has taken the form of substantial improvements in road network quality. In addition, there appears to be a sound strategic framework in place to reverse the trend towards deterioration and to address the neglect of past decades. In Ethiopia, the proportion of main roads in good condition has increased from 15 per cent in 1996 to 25 per cent in 1999. In Ghana, it increased from 15 per cent in 1997 to 30 per cent in 1999. However, these improvements were confined to main and urban roads and have not been seen on rural roads.

The new procedures for managing road maintenance resources have also impacted operational efficiency. Indeed, most road maintenance works financed by road funds are executed by private contractors. More transparent management and disbursement arrangements, as well as more stable resources, have resulted in a reduction of road maintenance costs per kilometre by 10 to 20 per cent in Zambia, Ethiopia and Ghana. However, allocative efficiency remains weak, even with the presence of road users on road fund boards. In the absence of fully functional maintenance management systems, funds have been allocated with little economic prioritization.

Another important finding was that dedicated financing is a necessary but not sufficient condition for stable and sustainable road maintenance. Another concern was the unevenness of the impact of the reforms on road quality and road user costs when absorptive capacity did not increase to match additional funding. Brushett and Kumar (2001) added that the sustainability of the road fund's financial gains was likely to remain uncertain unless more robust arrangements were put in place for the adjustment of road user charges to keep pace with changing needs and inflation. They also indicated that more attention had to be given to incentivizing road agencies to improve performance, exploit new technologies and review standards.

The most recent comprehensive assessment of the state of implementation of these funds was carried out by Gwilliam and Kumar (2003). This work has brought the benefits of such reforms into focus, especially in terms of funding availability and execution capacity. In most countries, revenues are less than the required level, with approximately 30 to 80 per cent of maintenance needs being met, while this is still well below what is needed for

true sustainability, it is marked progress over the 15 to 20 per cent common in the early 1990s. Improvements in operational efficiency and resource allocation are still limited, although they appear to have been strong enough to reverse the trend towards a decline in external (donor) support to the sector.

The major findings about the impact of financing reforms by Gwilliam and Kumar are summarized in table 1.

Table 1. Assessment of impact of financing reforms

Criteria	Assessment
Overall	"Evidence on new road funds in Africa… finds that they have not undermined fiscal flexibility. Moreover, they have improved administration of road funding (in terms of execution capability) and its outputs (in terms of road conditions)".
Maintenance funding	"Underfunding has been reduced but it remains a serious problem".
Resource use efficiency	"Despite limitations (inadequate capacity of maintenance providers), maintenance costs have been reduced".
Resource allocation efficiency	"Contractors have become better able to absorb allocated funds..." but "… in practice resource allocation continues to be driven by standard formulae rather than planned reviews of programmes put forward …"
Road quality impact	"Long term declines in road quality have been arrested and in some countries significantly reversed".

Source: Gwilliam and Kumar 2003.

VI. TRACKING THE PERFORMANCE OF ROAD FUNDS

RMI (now RMF) developed a simple "matrix", updated on an annual basis, to track the progress of road management reforms. The matrix tends to focus on "second generation" road funds. The matrix covers 28 sub-Saharan African countries in the process of implementing road financing and management reforms, including, but not limited to the 19 RMF partner countries. The main purpose of the matrix is to provide a regularly updated

"snap shot" of the structure of the road funds, their sources of financing and the level and allocation of expenditures. The matrix also provide comparative information on road policy and management arrangements as well as on road conditions.

All but four of the countries covered in the matrix have road funds in place. It is uncertain whether or not they are true "second generation" road funds. For the most part, they have most of the characteristics of "second generation" road funds. Most have a management board, but just over half have a private sector majority. However, the number of representatives from the private sector may not be the most important criteria for efficient road funds. It is more the presence of the private sector which seems to make a difference.

Perhaps not more than five or six road funds depend solely on road user charges, mostly raised through a fuel levy. A key problem suffered by just under half of the funds is that road user charges are not directly channeled to the Road Fund. This leads to delays and uncertainties in the programming of work and decreases efficiency in the use of road maintenance resources. A surprisingly large number of funds (14 in total) are not meeting routine maintenance needs, although it appears that the level of resources would be sufficient if expenditures were properly prioritized. In only two or three cases are two thirds or better of total maintenance funding requirements met. However, in aggregate, performance does seem to have improved since 1999/2000, when the original case study reviews were carried out by Kumar. While the data on road network conditions is of variable quality, there is evidence of an increase in the proportion of publicly maintained roads listed in good or fair condition since 2000. Road funds have certainly contributed to this increase, especially in Benin, Ghana, Ethiopia and Zambia, where the average annual improvement has been at least 3 to 4 per cent since 2000.

In total 24 road funds are in place, of which nine were established since 2000. Management boards are featured in 23 of the road boards and the private sector has a majority of members on 13 management boards. Road user charges account for 90 per cent or more of revenue for 13 road funds. Fuel levies generally fall in the range of US$ 0.04 to 0.09, still short of the US$ .10 to .13 recommended by RMI. This may partially explain why only about one third of sub-Saharan African road funds meet routine maintenance expenditure targets.

VII. FINANCE IS NOT ENOUGH – THE LIMITS TO REVENUE GENERATION

Experience suggests that it is still difficult to raise sufficient revenues to fully meet the demand for maintenance. Countries adopting road financing reforms have found it easier to create road funds with an initial (incremental) road user charge than to adjust that charge and diversify sources of revenue – even where road user demand remains strong. Governments, in all cases, remain the final arbiters of the level of road user charges, and for a number of reasons have shown reluctance to carry out frequent upward adjustments. As noted by Potter (1997), there may be limits to the capacity of countries to raise fuel levies, as taxes and duties on fuel are already very high and an important contributor to general revenue.

Thus, the performance analysis of road funds leads naturally to the consideration of what has to be done to address the other aspects of road management. This is not to say that road funds have outlived their usefulness, indeed consolidating the impressive gains made to date and addressing other issues is crucial, but the underlying constraints to improved absorptive capacity and enhanced institutional efficiency remain unresolved. Addressing these constraints through improvements in the organization of road management services will therefore be necessary to garner efficiencies and cost reductions that can be passed on to road users.

VIII. THE IMPORTANCE OF INCREASING CAPACITY AND EFFICIENCY

Talvitie (1996) identified a number of factors relevant to road administrations in terms of enhancing organizational effectiveness. Table 2 below summarizes the key dimensions, as well as estimating the order of magnitude of cost savings. Subsequent experience suggests that these figures are on the conservative side – for example, contracting out maintenance works

Table 2. Sources of efficiency gains from road sector reform

Source	Cost savings
Decentralized programming	10 to 15 per cent
Improved data collection	2 to 3 per cent
Contracting out	5 to 15 per cent
Planning improvements-Shorter design cycle	5 to 30 per cent

Source: Talvitie 1996.

on a performance-specified basis in Latin America (Zietlow, 1998) and in Australia (Frost 2001) found that reductions of up to 40 per cent may be feasible.

The potential for exploiting such opportunities has been realized, to some extent, since the early days of RMI. However, it has proved more difficult to introduce and sustain these reforms than to reform financing. This is became they involve significant restructuring of existing institutions and require changing entrenched practices and procedures. SSATP's recent internal review of the progress achieved in this direction has recognized the existence of "two waves" which are summarized in table 3 below (Brushett 2004). The "waves" represent, early attempts at reform, many of which predate RMI, which were pursued into the mid-1990s, and more recent approaches which have pushed the message of commercialization[3] and its potential benefits. The review found that the agenda pursued under the first wave has been generally accepted and that in some areas, such as contracting out and downsizing plant and equipment pools, the recommendations are being followed in nearly all countries. However, because the first wave of reforms failed to bring significant improvements in efficiency, an environment for enabling the second wave of reforms developed.

Table 3. Road management restructuring in Africa – the two waves

	Reform measures
First wave	Contracting out works Downsizing plant and equipment pools Restructuring roads departments Retraining and retention Improving staff incentives Strengthening road management systems Separating responsibilities, identifying the core client functions
Second wave	Creating new institutional structures Contracting out network management Bring in appropriately structured boards Adding new services Spreading services Strengthening public relations Sharpening accountability and emphasizing client orientation

Source: SSATP.

[3] *The word "commercialization" is not synonymous with "privatization". In this context it is used to mean the adoption of appropriate, sound business management practices.*

IX. EXPERIENCE WITH ROAD MANAGEMENT RESTRUCTURING

A number of countries, Zambia is a good example, had first sought to restructure and improve incentives within the existing public sector frameworks, often in conjunction with an overarching public sector reform process. The limitations of such approaches have already been outlined, inter alia, by Heggie (1994) focusing on the impact of pay differences between the public sector, and competing private sector employers of skilled staff. Such differences remain important in most cases. However, in the case of Zambia, restructuring has had some impact on improved staff retention, and generally increased the level of qualified staff. Nevertheless, the capacity to increase work output and to reduce costs through higher staff productivity and more effective planning and delivery remains limited. For example, under this type of restructuring road management systems have not become well established and monitoring and evaluation have not really improved. Consequently, an increasing number of countries, including Zambia, have found it necessary to implement further institutional reform as a means of ensuring better road services and the adoption of business-oriented approaches to road management.

X. PROGRESS ON ROAD MANAGEMENT INSTITUTIONS

Experience with commercially managed road management institutions in Africa is much more limited than with road funds. Aside from Namibia and South Africa (not currently SSATP member countries), there are 12 sub-Saharan African countries at various stages of creating such institutions. These countries include Angola, Ethiopia, Ghana, Sierra Leone, Cote d'Ivoire, Malawi, Mozambique, Senegal, the United Republic of Tanzania, Mali, Uganda and Zambia. There is still no systematic performance review of these organizations to accurately quantify improvements. This is a high priority on the agenda for SSATP, and should be available by end of 2005. Some of the most important tentative conclusions include:

- Business orientation is difficult to achieve even with a conducive legal structure. Getting the right management and board of directors in place is crucial, as is effective and regular interface with stakeholders, including road users.
- Operational targets must reflect actual and expected financial resource levels. Management must have a sharper focus on

efficiency improvement. In fact, inadequate funding continues to be a major impediment to institutional progress.

- Institutional focus on a limited number of practical steps to improve efficiency, such as improving turnaround on procurement of works and contracting suppliers, can pay immediate dividends.
- Performance agreements, for the agency as well as for its senior management, can provide a framework for improved oversight and for measurable improvements in effectiveness and efficiency.
- Institutional improvements should take advantage of windows of opportunity. Regular implementation reviews should however be undertaken to ensure that changes are on track in relation to original plans.
- Ministerial oversight arrangements tend to be a neglected area of institutional reform. A weak policy and regulatory framework may undermine gains elsewhere.

XI. ADDRESSING THE CONSTRAINTS TO FURTHER PROGRESS – ENHANCING THE ROLE THAT GOVERNMENTS STILL HAVE TO PLAY

Ensuring that governments play an effective role in transport policy formulation and in regulation and oversight of newly created road sector institutions is seen as a neglected area of road sector reform. The importance of this role is frequently reaffirmed, but much of the earlier effort to create road funds, and now to establish agencies, appears designed to externalize key functions from central Government, and thus to avoid the perceived constraints of low pay and outdated procedures and practices. However, significant key functions, such as determining road standards, carrying out road classification and setting long-range planning goals tend to remain in the remit of governments. But if these functions are not carried out effectively, the performance of the new institutions are bound to suffer. For example, road funds will not receive the revenue increases they need and road agencies will not be in a position to deliver realistic network improvement programmes.

What can and should be done? Some tasks that government has traditionally undertaken can be further broken down, and more responsibilities can be delegated to agencies. For example, Malawi and Uganda are

considering this approach with regard to transport sector regulatory functions, which would, inter alia, cover the road sector. However, it remains unclear how such agencies would be funded. The residual functions of government may then be lesser in scope, but still critical in terms of content. It is conceivable that these functions could be performed by small, motivated and experienced teams advising ministers. Experience in many parts of the world suggests that, even with significant reforms in this area, pay and condition differentials will continue to exist, and they will not generally favour the public sector. Other means of motivating and rewarding staff need to come into play so that transport ministries are not perceived externally or internally as the residue left behind by the tide of change.

XII. INNOVATIONS TO IMPROVE ROAD SECTOR PERFORMANCE

The first innovation aims to exploit cost saving and performance enhancing technologies. Pinelo et al. (2003) suggest that research and development in road technologies has often been neglected as a means of improving road sector performance. Their work, focusing on Uganda and Mozambique as examples, hints at the potential that exists to harness new technologies that could substantially reduce unit capital cost as well as the average annual maintenance burden on low-volume roads in sub-Saharan Africa. Pinard et al. (2003) support this case and emphasize the need for administrations to move towards a more holistic and sustainable approach, and away from a purely technical view on choices of technology for roads.

Mainstreaming innovations may take time. Nevertheless, it is reasonable to expect that commercially oriented agencies would be better positioned to exploit opportunities for change: to review standards and past practices that are often inappropriate for current needs; to aggressively pursue cost reduction possibilities through the utilization of new approaches; to ensure that accrued benefits are passed on to road users, who will gain from lower costs and reduced travel times. It must be emphasized that these opportunities now apply as much to the paved main road networks of African countries as to the unpaved secondary and tertiary networks, where much of the original research was focused.

The second innovation aims at increasing the efficiency and effectiveness of road maintenance operations through the introduction of performance-based contracting for the management and maintenance of road networks. The objective of this relatively new concept is to ensure that the

physical condition of the roads under contract is adequate for the needs of road users over the entire period of the contract. This type of contract significantly expands the role of the private sector, from the simple execution of works to the management and conservation of road assets. The Performance-Based Management and Maintenance Contract (PBMMC) tries to address the issue of inadequate incentives in traditional contracts (the more quantities, the more the contractor is paid). In order to maximize profits under PBMMC arrangements, the contractor must reduce his/her activities to the smallest possible volume of intelligently designed interventions, which nevertheless ensure that pre-defined indicators of service levels are achieved and maintained over time. Within the contract limitations, and those required to comply with local legislation, technical and performance specifications, and environmental and social regulations, the contractor is entitled to independently define: (a) what to do, (b) where to do it, (c) how to do it, and (d) when to do it. The role of the road administration and of the employer is to enforce the contract by verifying compliance with the agreed service levels and with all applicable laws and regulations.

The beneficiaries of the new concept are expected to be road users, road administrations, contractors and other private sector enterprises. In a wider sense, future generations will be able to benefit from better preservation of past investments in roads. Road users will know the service level they can expect in return for the payments they make for the use of the infrastructure (tolls, tariffs, user fees, taxes, etc.). Road administrations should benefit by obtaining better overall road conditions from the same levels of expenditure. For contractors and other private sector enterprises, the new types of contracts should open up new business opportunities, in which longer contract periods provide a more stable business environment. However, it may be future generations that benefit most, since they will not have to pay for the reconstruction of neglected roads.

The use of performance-based contracts is expected to develop rapidly in sub-Saharan Africa. Several projects are either at an advanced stage of preparation (United Republic of Tanzania – five contracts on 1,100 km of earth roads, Cape Verde – eight contracts on 330 km of paved roads, Chad – 600 km of paved roads) or at an early stage of preparation (Madagascar, Burkina Faso, Democratic Republic of the Congo, Mozambique) in sub-Saharan Africa. The World Bank has developed standard bidding documents for contracts above US$ 1 million that are applied to the above projects as well as those under preparation outside Africa (Cambodia, Indonesia, Paraguay, Thailand, Viet Nam). SSATP is looking into the possibility of developing smaller contracts below this threshold for small and medium-sized enterprises.

QUO VADIS?

Despite the sometimes uneven results on the ground, stakeholder support for the reform process remains strong. Evidence to this effect comes from a survey among 142 stakeholders in 7 RMI member countries (Pinard and Kaombwe 2001). However, the survey also indicated, that improvements may remain fragile unless firmly backed by a sustainable financing scheme. There was also a plea for more technical support and the availability of appropriate advocacy tools in the member countries, the advocacy tools will be used as a means to convince decision makers that the full vision of commercialization must be realized. Nyangaga (2001), from his experience in Kenya, sets out the obstacles to effective implementation of road sector reform. These underlie the need for governments to be informed and committed partners. He identifies, in particular, the reluctance of government to give up traditional power and responsibilities to new institutions. This is why SSATP has seen the need to become increasingly engaged in the development of tools and methodologies that are supportive of commercial management in the road sector. Of course, these tools must be well adapted to sub-Saharan Africa's requirements.

Expectations have been raised among road users and other beneficiaries about the impact of road sector reform in Africa. Generally the direction of reform has been good, although the speed and efficiency of change leaves something to be desired. Even as matters stand. Africa's road sector has probably performed as well, if not better, than any other sector in recent years. This is starting to show in the level of expenditures in relation to GDP. The areas that are now going to need greater attention from decision makers and external partners are reasonably clear. The priority is now to design and then implement imaginative strategies and monitorable programmes to achieve results on the ground.

REFERENCES

Brushett, S. and A. Kumar, 2001. "Improving road management and financing: A review of some recent experience of policy reforms in Africa", *Proceedings of the First Road Transportation Technology Conference in Africa,* Arusha, United Republic of Tanzania, pp. 288-304.

Brushett, S., 2004. Restructuring Road management in Africa, presentation to World Bank Transport Network (Washington, D.C., World Bank).

Chipewo, H., 2003. National Roads Board of Zambia – origin of the board and involvement of road users in the decision making process, presentation to PIARC World Congress, Durban, South Africa.

Fay, M. and T. Yepes, 2003. "Investing in Infrastructure – What is Needed from 2000 to 2010?", Policy Research Working Paper No. 3102 (Washington, D.C., World Bank Infrastructure Vice Presidency).

Frost, M., 2001. "Imperatives in Future Road System Management in Africa: The Australian Case", 14th IRF World Road Congress, Paris.

Gwilliam, K. and A. Kumar, 2003. "How effective are second generation road funds? A preliminary appraisal", *World Bank Research Observer,* vol. 18, pp. 113-128.

Harral, C.G. and A. Faiz, 1988. "Road Deterioration in Developing Countries – Causes and Remedies", Policy Study (Washington, D.C., World Bank).

Heggie, I.G., 1994. "Commercializing Africa's Roads: Transforming the Role of the Public Sector", SSATP Working Paper No. 10 (Washington, D.C., World Bank).

Heggie, I.G. and P. Vickers, 1998. "Commercial Management and Financing of Roads", Technical Paper No. 409 (Washington, D.C., World Bank).

Heggie, I.G., 2003. "Commercializing road management and financing of roads in developing and transition countries", *Transport Reviews,* vol. 23, No. 2, pp. 139-160.

Kumar, A., 2000. "Assessment of selected road funds in Africa. Case study of Benin, Ethiopia, Ghana, Kenya and Zambia", SSATP Working Paper No. 51 (Washington, D.C., World Bank).

Nyangaga, F., 2001. "Reforming road management in sub-Saharan Africa", SSATP Technical Note No. 32 (Washington, D.C., World Bank).

Pinard, M.I. and S.M.K. Kaombwe, 2001. "Implementation and impact of RMI. A survey of stakeholders in seven member countries", SSATP Working Paper No. 62 (Washington, D.C., World Bank).

Pinard, M.I., C.S. Gourlay and P.A.K. Greening, 2003. "Rethinking traditional approaches to low road provision in developing countries", Transportation Research Board 1819 Paper No. LVR8-1153 (Washington, D.C., World Bank).

Pinelo, A., P. Carvalho, Y. Kamhi and A. Ghazla, 2003. "Role of research and development in road sector reform", Transportation Research Board 1819 Paper No. LVR8-1140, (Washington, D.C., World Bank).

Potter, B.H., 1997. "Dedicated road funds: a preliminary view on a World Bank initiative", PPAA/97/7, Fiscal Affairs Department (Washington, D.C., International Monetary Fund).

Talvitie, A., 1996. "International experiences in restructuring the road sector", paper presented at Transportation Research Board Annual Meeting, Washington, D.C.

World Bank, 1997. Zambia, Staff Appraisal Report – Project to Support a Road Sector Investment Program. Report No. 16539-ZA.

World Bank, 2001. Malawi, Public Expenditures: Issues and Options. Report No. 22440-MAI.

Zietlow, G., 1998. "Cutting costs and improving quality through performance specified road maintenance contracts – pilot experiences in Latin America offers lessons for Africa", SSATP Technical Note No. 14 (Washington, D.C., World Bank).

ROAD FUNDS: A CASE STUDY OF SUSTAINABLE ROAD MAINTENANCE IN INDIA

D.P. Gupta*

ABSTRACT

In the past, road maintenance suffered from lack of resources and was a low priority compared with capacity augmentation of main roads and expansion of the road network needed to improve connectivity to villages. There is growing recognition in India that continuing to allocate insufficient funds for road maintenance is not sustainable in the long run. The country has been moving towards creating second generation road funds both at the central and state government levels. In addition, bold initiatives are being taken for undertaking highway projects through private financing. This ensures optimal operation and maintenance during the concession period, which spreads over 15 to 20 years. Toll-based maintenance of highways is another concept gaining momentum in the country. This ensures quality service to road users. It also enhances the availability of upfront capital finance, to the government from the entrepreneur, that can be utilized for the provision and maintenance of road infrastructure. Even at local body levels, resources are generated by levy of cess on agricultural produce and a part of funds raised in this manner is utilized for the maintenance of rural roads. Efforts are also being made in strengthening the institutional arrangements for proper planning of maintenance interventions and their effective delivery on the ground. These experiences are shared in this paper.

Keywords: Road maintenance financing, Central Road Fund, Kerala Road Fund, Uttar Pradesh Road Fund, road funds in India.

BACKGROUND

Roads have come to occupy a dominant position in India's transport system. They are considered critical to economic growth and social development. At 3.2 million km (excluding urban/municipal roads), India's road

* *Director (Projects), Asian Institute of Transport Development and former Director-General (Road Development) and Additional Secretary to the Government of India; e-mail: d_p_gupta@vsnl.net.*

network is one of the largest in the world. When viewed as assets, roads have enormous value. The current replacement value of the existing network has been estimated at Rs 5,000 billion (equivalent to US$ 115 billion). Assets deteriorate as a result of normal wear and tear and owing to the ravages of weather and time. The life of a road is subject to an inexorable cycle of construction, inadequate (or non-existent) maintenance, deterioration, collapse and reconstruction. The loss in asset value resulting from the deterioration of existing road networks is high. Regarding as precious infrastructure road assets must therefore be maintained like any other asset.

Road maintenance has suffered in the past due to shortages of resources. In addition, road maintenance has been considered a low priority compared with capacity augmentation of main roads and construction of all-weather roads to provide connectivity to villages. Maintenance is considered a non-plan activity. Budget allocations are often cut at short notice in response to difficult fiscal conditions. In such situations, it is usually the non-plan activities which receive the axe. As a result, maintenance becomes the common casualty.

Often, maintenance is postponed in the hope that fiscal conditions will improve. But this seldom happens and road maintenance continues to be cut or deferred. It is because of this structural problem that both Japan and the United States of America, which are recognized as having well-developed budgetary systems, opted in the mid-1950s for earmarking of road funds to ensure a stable flow of finances to support their road sectors.

I. ROAD FUNDS IN INDIA

There has always been a debate among planners and economists about the merits of earmarking funds for a specific sector. Additional earmarked taxes to fund road sector improvements and maintenance clearly show a medium-term commitment on the part of the Government. It may be added that these funds may continue to be treated as part of the overall government revenues. These are liable to be siphoned off for other purposes if government runs into financial difficulties. However, the second generation road funds being set up in Africa appear to be easier to sustain in the long run.[1] The revenues for such funds are obtained from levies and surcharges designated as “user charges”. The main types of such charges are vehicle

[1] *Please see the articles by Steven Brushett and J.O. Haule on the experience of road funds in Africa in this volume.*

licence fees, levies on fuel (petrol and diesel) and tolls. India is also moving towards creating such second generation funds for roads to supplement the existing budgetary resources.

A. Initiative at the central government level

The Central Road Fund has existed since 1929. The levy was low and was confined to petrol. It remained unchanged until 1998. As a result, the proceeds to the fund were meager, amounting to only about Rs 220 million (US$ 5 million) in 2000.

In September 1998, the Government of India decided to levy an additional excise duty of Rs 1.00 per litre on petrol and dedicate the proceeds for the road sector. In March 1999, high-speed diesel became subject to this duty. The Central Road Fund was totally revamped and the revised Act was passed by the Parliament in late 2000. The management of the fund is governed by the provisions of the Central Road Fund Act, 2000. Under the Act, distribution of the CRF is specified as under:

(a) 50 per cent of the cess on high-speed diesel for development of rural roads;

(b) The remaining 50 per cent of the cess on high-speed diesel and the entire cess collected on petrol as follows:

  (i) 57.5 per cent for development and maintenance of national highways;

  (ii) 12.5 per cent for construction of road over/under bridges over the railways and erection of safety works at unmanned railroad crossings;

  (iii) 30 per cent on development and maintenance of state roads (10 per cent of this amount is kept as a reserve for the implementation of schemes of interstate and economic importance).

At first, annual accruals to the fund were about Rs 55 billion. Currently, this levy is Rs 2.00 per litre (annual accruals Rs 120 billion, equivalent to US$ 2.8 billion).

The Central Road Fund Act includes maintenance of national highways and state roads (excluding rural roads) in addition to development. However, currently proceeds out of these funds are used mainly for:

- Augmentation of capacity in respect of selected national highways,
- Improvement of state highways,
- Providing all-weather access to unconnected settlements with populations of or more 500 (250 in case of hills, deserts and tribal areas).

B. Initiatives at the state government level

A few states have also set up dedicated road funds. The annex gives some brief examples. Uttar Pradesh is the only state with a dedicated fund specifically meant for maintenance. Box 1 gives general details.

Box 1. Uttar Pradesh Road Fund

(i)	Year of establishment	1998
(ii)	Purpose	Maintenance of state roads
(iii)	Source	Increase in sales tax on • Motor spirit (petrol) from 14 to 20 per cent • High-speed diesel from 16 to 20 per cent
(iv)	Annual proceeds	Rs 4 billion (2004-05)
(v)	Collection	By oil companies
(vi)	Mechanism	After collection, oil companies transfer the proceeds to the consolidated fund of the state.
(vii)	Management	• Advisory Committee (22 members) is headed by the Minister of Public Works; representatives of government departments and users are members; • Allocations are made as per plans approved by the committee; • Rules and regulations have been approved by the Accountant-General; • Details of expenditure and progress are kept by the Engineer-in-Chief, State Public Works Department.

Source: Uttar Pradesh Public Works Department.

The finance commissions, set up every 5 years, also examine the requirements of maintenance in several sectors of the economy and make recommendations for allocation of maintenance funds for state roads. The finance departments of the states would need to ensure that the amounts recommended are allocated to the road agencies.

C. Public-private partnerships

India has also began to upgrade and augment the capacity of main roads through private sector financing on a build-operate-transfer basis. The Government of India and several states have modified their existing legal provisions for enabling projects to be awarded to private entrepreneurs for a specified period of concession during which they are allowed to levy fees and tolls on road users. They are offered financial incentives, such as tax holidays, duty-free import of road construction equipment and provision of government grants to meet the financial viability gap. Once the concession is granted, the private entrepreneur is obligated to construct the facility and thereafter operate and maintain it at his cost. This ensures a high-level of maintenance and quality service to road users during the concession period. Usually, a period of 15 to 20 years is allowed after the opening of the facility.[2]

At the end of the concession period, the facility reverts to the government. Normally, such a facility may require further capacity augmentation or upgrading to meet the increased traffic demand and the government is likely to offer the same stretch on the same terms.

II. ROAD MAINTENANCE ARRANGEMENTS

A. Toll-based maintenance

Several projects for capacity augmentation of main roads (national and state highways) are being undertaken by the Government either out of its own funds or with external assistance from the World Bank, the Asian Development Bank and the Japan Bank for International Cooperation (JBIC). The Government is contemplating opening these roads to private entrepreneurs for toll-based operation and maintenance upon opening the facility to road users. This will bring about improvement in the level of service, higher productivity of road transport and savings in vehicle operating costs. Box 2 gives brief details of this concept.

---

[2] *Interested readers are referred to an article by B.N. Puri in volume 73 of the Bulletin. The article is also available at <http://www.unescap.org/ttdw/PubsDetail.asp?IDNO=143>.*

Box 2. Concept of operation and maintenance of highways through private financing

The concept involves concessions to private entrepreneurs to operate and maintain highways for a given period after the project is completed through government budgetary sources or other funds. The entrepreneur is permitted to collect tolls from the road users at the rates fixed by the Government. A reasonable increase in toll rates is allowed with time which could be yearly or once in three/five years. Such an increase in toll rates may be linked to the consumer price index or wholesale price index.

The concessionaire will, for a given period, pay the Government upfront fees as a lump-sum and in yearly or six-monthly installments. This payment could be used to supplement the highway budget or alternatively for paying grants to meet the financial viability gap of the BOT entrepreneurs engaged for capacity augmentation of the highway.

Apart from operation and maintenance of the highway, the Government can also stipulate provision of certain asset enhancement and corridor management features, such as:

- Land management
  - Prevention of encroachment
  - Control of ribbon development
  - Access control
  - Regulating use of right-of-way by utilities
- Tackling of safety hazards and traffic bottlenecks
- Control of overloading of vehicles
- Incidence management

Complications with this scheme arise if traffic volumes exceed design capacity before the end of the concern period. This can be addressed by granting right of first refusal for capacity augmentation to the concessionaire or by amending the concession period. This has to be thought through and the stipulations must be made in a transparent manner.

The Government also has to safeguard the public interest and ensure proper transfer at the end of the concession period. This should ensure that the facility is in reasonably good condition at the time of transfer.

It is noteworthy that, sometime back, the state government of Madhya Pradesh took the bold initiative of undertaking toll-based maintenance of state highways through private financing. Table 1 gives brief details of two such cases.

Table 1. Examples of toll-based maintenance of state highways

Serial No.	Particulars	Bhopal-Dewas state highway	Jaora-Nayagaon state highway
1.	Length	143 km	103 km
2.	Scope of work	Improvement of minor works like culverts; routine and periodic maintenance; renewal of road by premix carpet on 28 km length per year; construction of toll booths at two locations; bringing berms into proper condition	Improvement of culverts and other cross drainage works, drains, etc.; routine and periodic maintenance; toll booths at two locations; renewal of riding surface as per approved programme – 30 km per year on average; bringing berms into proper condition.
3.	Period of concession	Six months for improvement works and three years for maintenance (project already completed)	1,791 days (started early 2000)
4.	Toll rates	Car: Rs 10 Bus: Rs 25 Truck: Rs 35	Car: Rs 10 Bus: Rs 25 Truck: Rs 35
5.	Offer by entrepreneur (criteria of work award)	Fixed concession period of three years and six months, including time for completion of improvement works; maximum offer of payment by the entrepreneur to the government: Rs 44.6 million paid by entrepreneur to state government in 12 quarterly installments spread over 3 years.	No grant by the state government and no financial offer by the entrepreneur, but work awarded on the basis of least concession period.
6.	Transfer	Transfer in good condition to the state	Transfer in good condition to the state

Source: Madhya Pradesh Public Works Department.

In this context, it may be asserted that the "user pays" approach prevents road maintenance from becoming a burden on the state exchequer, and the level of service provided for road users improves in the process.

B. Performance-based maintenance

With the assistance of the World Bank, the state government of Andhra Pradesh introduced performance-based maintenance contracts on four highway stretches with a total length of 1,200 km in four districts. Payments on the contracts are linked to performance parameters of both routine and periodic maintenance. The National Highways Authority of India has also taken up maintenance contracts on some national highway stretches. The level of service to road users was enhanced in these schemes. However, funds for such contracts are being provided out of the government budget.

C. Community participation in road maintenance

Some states in India levy cess on food grains through their market committees and the proceeds are utilized, among other items, for the construction of link roads and their maintenance in rural areas. This is because there is a general understanding among farmers that a good road network in their areas allows them to fetch a better price for their produce. This gives them an incentive to increase production as the size of the market increases due to a well maintained road system. It also helps them to obtain their consumer goods and other inputs more cheaply and improves their access to schools, health care and market facilities.

The states of Punjab and Haryana started these practices in the early 1970s. Rajasthan followed immediately thereafter. Uttar Pradesh and Madhya Pradesh have also joined such moves. Funds in such cases are managed by market committee boards.

In the sugar-cane belts of some states, sugar cooperatives contribute funds for repair and maintenance of roads. Similarly, in coal field areas, mining authorities contribute towards road rehabilitation and maintenance.

Some of the states are studying the international practices of routine maintenance through community-based micro-enterprises. A few pilot projects are likely to be taken up in Uttar Pradesh and Himachal Pradesh.

D. Utilizing funds under poverty alleviation and employment creation schemes

The Ministry of Rural Development provides funds to the states under several schemes aimed at providing employment opportunities and bringing about poverty alleviation. One such scheme is *Sampoorna Grameen Rozgar Yojana* (SGRY), aimed at rural employment. SGRY is open to all rural poor who are in need of wage employment and are prepared to do manual work. A part of the funds under this scheme are used for construction of earthen tracks in rural areas. Recently, another scheme, called the National Food for Work Programme (NFWP), was launched in 150 of India's most undeveloped districts in an attempt to increase the generation of supplementary wage employment. Like SGRY this programme is open to all rural poor who are in need of wage employment and are prepared to do manual unskilled work. For the year 2004-05, an amount of Rs 20.20 billion has been allocated for this purpose in addition to 2.0 million tonnes of food grains. Since routine maintenance of rural roads is a labour-intensive activity, a part of the funds available under such programmes can be utilized for this purpose.

E. Strengthening institutional arrangements

Along with creating sustainable arrangements for financing road maintenance, there is a need to reform the institutional system of delivery of maintenance works. Maintenance planning can be improved by establishing road management units at the field level and using maintenance management system tools so that maintenance works are identified and prioritized based on road conditions and traffic. In addition, training workers in order to enhance their skills in various maintenance jobs has to be a continuous process.

CONCLUSIONS

Roads are huge assets and, as such, need to be preserved. Maintenance has recently emerged as a key issue in India for sustaining investments in the road sector. Political commitment to this issue is solidifying, although in many states it is not profound. Several strategies for the mobilization of additional resources are being adopted to provide an adequate and steady flow of funding for road maintenance. These strategies span across the central Government, state governments, local authorities and community-based organizations. The private sector has also evinced interest in financing operations and maintenance for high-density highway corridors on long-term contracts. The delivery system is also steadily improving, with pressure building

up from road users. The momentum has to be kept up as there is still a large backlog due to past neglect in maintenance. India is confidently meeting the challenge of upgrading and expanding the existing road network and its maintenance.

Annex
Dedicated funds for roads at the state level in India

Kerala

The state of Kerala created the Kerala Road Fund in 2001. The Fund's objective was to mobilize non-budgetary resources for the development and maintenance of the state road network. Box 3 gives a summary of the salient features of the Kerala Road Fund.

Box 3. The Kerala Road Fund

Legal position	The Kerala Road Fund was created to demonstrate greater commitment to the development and maintenance of the PWD road network and to mobilize greater non-budgetary resources (user charges, private sector involvement and external funding). It was constituted under the Kerala Road Fund Act 2001, which became law on 23 November 2001.
Purpose	The Road Fund is to finance: • Routine recurrent and periodic maintenance of Public Works Department roads; • Development of existing road network system including upgrading roads maintained by the PWD; • Construction of new roads wherever necessary; • Development of such safety projects as are deemed essential for safe and smooth traffic; • Research related to maintenance and development of roads; • Any cost-sharing for donor-funded projects intended for any or all of the purposes mentioned above.
Sources of funding	The Road Fund shall consist of: • All moneys received from the Central Road Fund established under the Central Road Fund Act, 2000;

(continued to page 56)

(continued from page 55)

- The contribution made by the Government;
- All fees, fines and other amounts collected by the Government according to the provisions of the Kerala Highway Protection Act, 1999;
- All payments made by the concessionaire as per the concession agreement;
- All amounts credited to the Bridges Fund established under section 12 of the Kerala Tolls Act, 1976;
- The user fees collected by the Government agency or the statutory body under the Kerala Road Fund Act;
- Grants or loans or advances made by the Government of India, the Government of Kerala or other institutions;
- All returns on investments made by the Road Fund Board directly or through a government agency or statutory body;
- Any amount borrowed by the Road Fund Board;
- Any other amount authorized for credit to the Fund under the provisions of the Road Fund Act or rules made thereunder or any other law for the time being in force;
- Every year, the Government shall contribute to the Fund an amount equal to 10 per cent of the tax collected by them in the previous year under the provisions of the Kerala Motor Vehicles Taxation Act, 1976, and the said amount shall be charged to the Consolidated Fund of the State.

Projects

Projects under the Road Fund can be taken up in association with private entrepreneurs or financing institutions on a cost- and benefit-sharing basis. If proposed projects are not likely to be financially rewarding enough to attract private participation, incentives in the form of a share of the costs involved could be given.

(continued to page 57)

(continued from page 56)

Management

The Board shall consist of the following members:

- Chief Minister, ex officio, who shall be the Chairman of the Board
- Minister in charge of Public Works, ex officio, who shall be the Vice-Chairman of the Board
- Minister in charge of Finance, ex officio
- Minister in charge of Transport, ex officio
- Principal Secretary to the Government in charge of the Public Works Department, ex officio, who shall be the Member Secretary of the Board
- Law Secretary, ex officio
- Chief Engineer, Roads and Bridges, ex officio
- Three persons nominated by the Government from among the heads of financial institutions engaged in the business of infrastructure, scheduled banks or technical or engineering personnel working in national-level institutions.

There shall be an executive committee consisting of (a) the Minister in charge of Public Works (Chairman of the Executive Committee), (b) the Principal Secretary to the Government in charge of the Public Works Department (Vice Chairman of the executive committee), (c) Finance Secretary to Government, (d) Law Secretary, (e) Chief Engineer, Roads & Bridges, and (f) two members nominated by the Board from among the nominated members of the Board.

Madhya Pradesh

The state of Madhya Pradesh has recently created a *kisan sadak nidhi* (farmer's road fund) through levy of a cess on agricultural produce, 85 per cent of the proceeds are earmarked for the improvement and maintenance of the major district roads and rural roads. An amount of Rs 1.2 billion (US$ 28 million) per year is available out of this fund.

Karnataka

The state of Karnataka has recently created a dedicated fund for rehabilitation and maintenance of rural roads. The fund is called Chief Minister's *Grameen Raste Abhivrudhi Nidhi* (CMGRAN). An amount of Rs 300,000 per km for periodic renewal and Rs 40,000 per km per year for routine maintenance for black-top rural roads is allocated to the *Zilla Parishads* (district-level local bodies). For water-bound macadam and gravel roads, the norms for routine maintenance are Rs 25,000 and Rs 20,000 per km per year. This is a good scheme for protecting the investments being made in the development of rural roads in the state.

Uttar Pradesh

The state government of Uttar Pradesh created a dedicated fund for the maintenance of state roads in 1998. The fund is financed through an increase in sales tax on motor spirit and high-speed diesel. Oil companies transfer the proceeds to the consolidated state fund after their collection. Then the funds are allocated to the state road fund. These funds are managed by an advisory committee headed by the Minister of Public Works. Rules and regulations for the use of funds for different categories of roads have been formulated and were approved by the Accountant-General of the state. Current accruals are estimated to be about Rs 4 billion. Consequently, there has been a significant increase in allocations for road maintenance. Planning and implementation arrangements are being strengthened for the efficient use of funds and effective delivery of maintenance operations.

ROADS BOARD NEPAL: A SUSTAINABLE APPROACH TO ROAD MAINTENANCE MANAGEMENT

Dipak Nath Chalise*

ABSTRACT

Roads should be viewed as important national assets. Like any other asset, roads must be regularly maintained to keep them serviceable. However, it has been difficult to meet road maintenance needs in Nepal through government budget allocations. As roads provide a vital service, they can be maintained by adopting a business oriented approach. Charging users for services provided is an important first step in this process. In line with this concept, the Government of Nepal has established a new maintenance regime through the establishment of a roads fund and the Roads Board Nepal. The following article discusses the management and operational aspects of the Board and experiences gained from its first two years of operation.

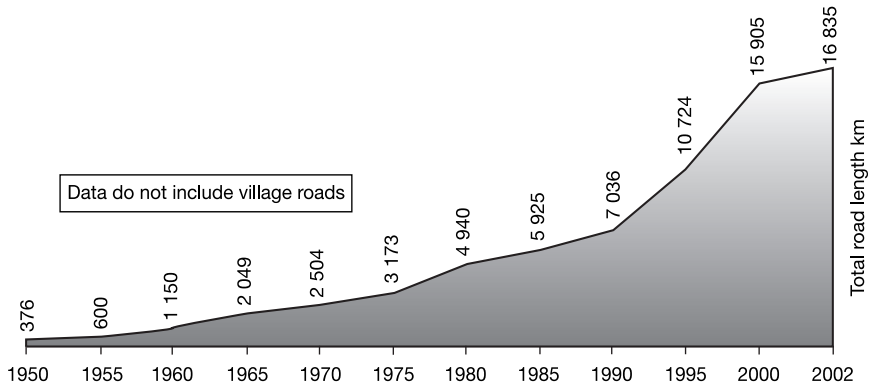
Keywords: Roads Board Nepal, Roads Fund, Road maintenance financing in Nepal.

INTRODUCTION

The national road system

Roads are the principal mode of transport in Nepal, with no other mode playing a significant role in Nepal's transport sector. Over the years, there has been considerable expansion of the road network from a meagre 376 km in 1950 to 16,835 km in 2002 (Nepal 2002). New road developments are taking place at a rate of about 700 km per year, of which about 100 km are strategic roads and the rest are local roads. Figure 1 shows road network expansion in Nepal between 1950 and 2002.

* *Executive Director, Roads Board Nepal; e-mail: dipak-chalise@roadsboardnepal.org*



Source: Nepal 2002.

Figure 1. Road development in Nepal

The country's road network is divided into two broad categories. These are as follows:

(a) The Strategic Road Network (SRN) consists of 4,830 km, 67 per cent of which is blacktop, 17 per cent gravel and 16 per cent earthen roads. It is made up of two types of roads: 15 national highways occupying 62 per cent of the network and 51 feeder roads occupying 38 per cent of the network. SRN is managed by the Department of Roads. Further details on pavement type and by type of road are provided in table 1;

(b) The Local Road Network (LRN) has a length of 23,922 km with 21,724 km of rural roads and 2,198 km of urban roads. In contrast to SRN, it has 7.0 per cent black top, 24.1 per cent gravelled and 68.9 per cent earthen roads (Nepal 2004). However, some questions remain as to the veracity of data regarding the actual length of motorable rural roads. The responsibility for LRN rests with local government bodies, but technical backstopping is provided by the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR). Table 2 provides further details on pavement type and road length by type of road.

Table 1. Classification of the strategic road network by type of pavement

Type of road	Total length (km)	Pavement type (percentage)		
		Black top	Gravel	Earthen
Strategic road network	4 861	66.6	16.9	16.5
National highways	3 029	77.9	10.1	12.0
Feeder roads	1 832	48.0	28.2	23.8

Table 2. Classification of the local road network by type of pavement

Type of road	Total length (km)	Pavement type (percentage)		
		Black top	Gravel	Earthen
Urban roads	2 198	43.7	29.7	26.6
District roads	9 775	6.0	31.1	62.9
Village roads	11 949	1.1	17.3	81.7
Total length (km)	23 922	1 670	5 761	16 491
Percentage of total	100.0	7.0	24.1	68.9

Road accessibility

Nepal has a very low road density compared with the other South Asian countries. Out of the 75 districts in the country, 12 districts still have no road access. Rural areas in 15 districts are yet to be connected to their district headquarters. The major challenge lies in providing an appropriate level of road infrastructure and transport services to these remote and scattered settlements to support developmental activities. The ultimate goal should be to reduce the level of poverty. To improve the level of accessibility, each year about 700 km of new roads and 300 km each of engineered and non-engineered village roads are being added to the country's road network (Deoja 2005).

Road development strategies

Past road development strategies focused on the movement of goods and passengers within the country. During the 1970s, priorities shifted towards developing the north-south feeder roads. After 1990, road development objectives were defined in terms of maintaining economic growth, supporting poverty alleviation and reducing regional imbalances.

A major shift in policy aimed at addressing road maintenance problems was taken up in the early 1990s. Road user financing of road maintenance was

developed through a trial toll system on a road section under the authority provided by the Public Road Improvement Toll Fund Act, 1995. The acceptance of user charges for road services from the eighth plan onwards is considered to be a major step in the right direction. The establishment of a roads board and a dedicated fund for road maintenance in 2002 was a continuation of this policy.

Network condition and traffic

In the 1980s, roads were built without giving much attention to their future maintenance needs. Consequently, road assets were being lost at a rate of 5 km per year for every 100 km of roads built. Donor-supported higher standard roads were subject to the same rate of decline. Between 1988 and 1992, the length of roads in "poor condition" almost doubled. In addition, the general condition of the major road network was deteriorating rapidly, with about 180 km of good road being lost every year. This dismal situation however, started to improve after 1992 owing to the implementation of many road maintenance projects funded by donor support from Swiss Agency for Development and Cooperation, IDA and DFID. Table 3 provides strategic road surface conditions for different years. Table 3 shows that, after 2001, the situation began to worsen, with a return to deteriorating road conditions.

Table 3. Strategic road network surface condition

Year	Surface condition (percentage)		
	Good	Fair	Poor
1992	NA	NA	52
1999	31	57	12
2001	43	48	9
2003	15	63	22

Note: NA = Not available.

The highway information management system established in DoR conducts regular manual traffic counts at specified locations on SRN. Based on the available data, a recent study has forecasted the national average annual traffic growth rate of 5.5 per cent for the period 2003-2007 and 6 per cent for 2007-2017. The percentage of the network with traffic volume of more than 250 vehicles per day is envisaged to increase from 55 per cent in 2001 to 64 per cent in 2012.

Maintenance of road network

A policy shift in the maintenance of road assets was initiated with the realization that the transport system could only be sustained in the long run with strong commitment to preserving the existing infrastructure. Allocation of resources for maintenance will have to be based on the availability of resources and network priority. To ease pressure on the national budget, the investment on road maintenance will be recouped from user charges.

The negative impacts of inadequate investment on road maintenance came to light in 1988 when a study by SDC showed that Nepal was losing between 1 to 2 billion Nepalese rupees annually due to lack of proper road maintenance (SDC 1988). Past road maintenance activities were largely ad hoc in nature responding only to pressing maintenance problems. Actors involved in the road sector have focused more on new development than on the maintenance of existing assets. This has ultimately harmed road users as they have had to bear higher vehicle operating cost. In the long run, failure to maintain roads also ensures the need for expensive rehabilitation and reconstruction. Despite developing a planned road maintenance management system comprised of routine, recurrent, periodic, and emergency maintenance, its implementation proved to be difficult. Matching resource allocations to maintenance needs proved especially difficult (see figure 2).

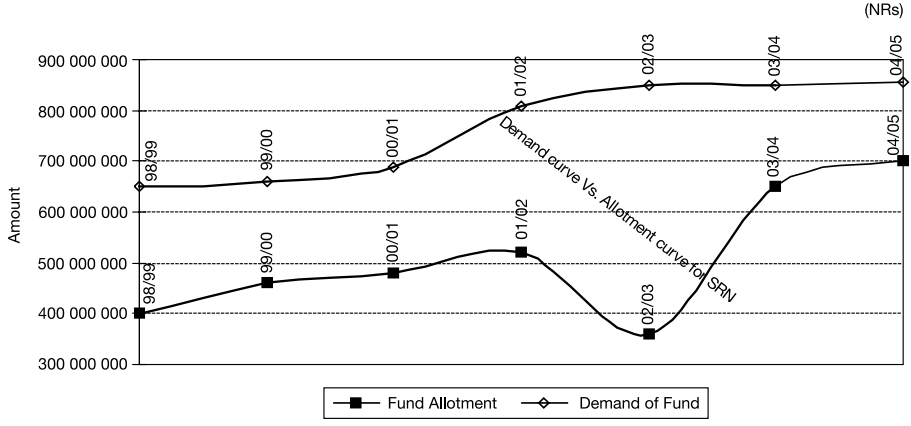


Figure 2. Comparison between demand and supply of maintenance budget by year

Facing this situation, it was necessary to develop an alternate approach in an effort to address a wide range of road maintenance issues. It became clear that:

- Road maintenance budget needs were growing faster than GDP;
- Budget allocations for maintenance were much too small to meet maintenance needs;
- There was lack of institutional mechanisms to ensure adequate provision and utilization of resources for road maintenance;
- The project approach could not ensure sustainable maintenance, as maintenance should be a continuous process supported by a stable flow of funds;
- Reform in the road maintenance regime was essential;
- Proven models applied elsewhere in other countries should be tried.

I. ROAD MAINTENANCE

A. The purpose

The main objective of road maintenance is to ensure the serviceability of the road network and minimize the cost of road transportation, which is comprised of:

(a) Agency cost:
  (i) Capital cost of construction;
  (ii) Maintenance of the facilities over their design life;

(b) Road user costs.

Many elements are factored into road user costs. Among these, vehicle operating cost (VOC) is the largest over the total life cycle of a road facility. VOC is defined as the price the user has to pay to move the vehicle per unit of distance. The prime concern is to control the variables that significantly contribute to VOC such as surface condition, roughness, speed and load. Better roads mean lower operation costs. The effect of VOC parameters can be assessed in economic analysis of road maintenance projects by using tools such as HDM IV.

There are both direct and indirect benefits from well maintained roads. Direct benefits are realized in the form of savings in VOC and travel time, reductions in the number of accidents and improvement in travel comfort. The major indirect benefits include improved access to social and economic opportunities and increased land value.

B. Road assets and their management

Huge amounts of resources must be allocated to build and maintain roads. However, they are often treated as a free infrastructure service. This may be appropriate when it is necessary to provide access for social and strategic reasons. However, in order to recover construction costs and fund maintenance, they should be managed in a businesslike manner. A model for investment developed by Robinson et al. (1998) clearly shows that a relatively small amount of money spent on regular and periodic maintenance can save money by greatly reducing the need for expensive premature rehabilitation.

The restoration value of the existing road assets in Nepal is about NRs 100 billion. These valuable assets must be preserved and upgraded over time. This becomes particularly clear after considering their net benefit to the national economy. Fortunately, users are willing to pay a small charge in exchange for more efficient and safer road transport services. The better service can be delivered to the public by implementing a new road maintenance regime based on the fee-for-service concept. This would help to ensure the establishment of a system that recognizes the needs for road maintenance to be carried out on a continuing basis and provides a stable flow of funding for the purpose. It is estimated that Nepal requires about NRs 200,000 per km per year to keep its roads in serviceable and good condition through planned maintenance.

C. The concept of road maintenance funds

The concept of a dedicated road maintenance fund emerged as a means to raise the continuous flow of resources required to meet the perpetual needs of road maintenance. The concept is based on a funding arrangement through a fee-for-service model. Initially, many countries started with earmarking certain funds for road maintenance. These funds were administered by a separate funding agency. However, this arrangement suffered from many shortcomings and met with mixed results. These shortcomings include excessive government control, vagaries of the treasury, failure to institutionalize the distinct roles of the funding and road maintenance agencies and little or no representation of road users on the funding agency's board.

After retooling the dedicated road maintenance concept to address the aforementioned problems, the World Bank launched a Road Management Initiative (RMI) in 1988. RMI encouraged the development of second generation road funds in Africa, emphasizing their transparency and accountability. Second generation road funds involve segregation of (a) funding/controlling responsibilities from that of implementation and (b) "road user charges" from "general taxation revenues". Both the task of determining the level of road user charges and the allocation of revenues to implementing agencies are carried out by a user represented roads board (Heggie 1995).

RMI defines four sets of key principles for road funds, which are as follows:

- Involve road users in the management of roads;
- Secure enough money for road maintenance year after year;
- Ensure that all parities know what they are responsible for;
- Establish a system for managing road programmes with clear accountability.

Second generation road funds are autonomous agencies controlling the funding of road maintenance. These funds, now established in many countries, have the authority to raise revenues to finance their operation and control funding allocations. They are run by a professionally efficient management team and adhere to a market approach. The main purpose for the development of such a model was to create a businesslike environment for road maintenance management.

The key elements in the new maintenance regime include setting revenue collection and expenditure targets; securing the transfer of funds from the collection agents; approving the work programmes and maintenance budgets of the implementing agencies and allocating funds to them; monitoring maintenance works; and utilizing disbursed funds. In most cases, roads fund boards serve as the financer of maintenance services rather than a provider of services. The actual implementation of maintenance works is generally the responsibility of the road agencies to which funds are allocated.

D. Learning from international experiences

Road fund boards have operated in different countries for many years. Japan Road Council (1952), Transit New Zealand (1954), the Board of the Finnish National Road Administration (FINNRA 1990), the United Kingdom

Highway Agency Advisory Board (1994) and the South African Roads Board (1935) are some of the most notable boards. More recent experiences from the United Republic of Tanzania, Mozambique, Ghana, Zambia and many other countries from Africa and Latin America clearly show that progressive reform has been initiated in the road sector and consolidated over time through necessary changes in legal and regulatory regimes and management practices. In most of these countries, a second generation roads fund board is now in operation. The key characteristics of these new generation funds include a separate and small road fund organization with clear operational rules, oversight by a broad-based board with strong participation from user groups and the private sector and the agency's role as purchaser, not provider, of maintenance services.

To further reform measures, agencies implementing the actual works are also now being established as autonomous bodies with stakeholders represented on their management boards. TANROADS in the United Republic of Tanzania and Administração Nacional de Estradas in Mozambique are examples of such autonomous organizations. The South African National Road Agency, Ltd., is a much more advanced and mature organization. It is a fully commercial company with equity from the Government and the private sector.

Concerns have been raised about the possibility that additional road user charges or other kinds of levies imposed for financing road maintenance could have a negative impact on the consumer price index. However, studies show that this effect could be minimal and easily offset by efficiency gains from improvement of services provided by the road sector. For example, a study in Zambia showed that a levy to increase the price of gasoline by 2.0 per cent and diesel by 2.2 per cent would raise the VOC of cars, light trucks and articulated trucks by 0.5, 0.5 and 0.9 per cent, respectively. The resulting increase in the consumer price index for rural households and urban households with low to high incomes would be 0.06, 0.08 and 0.12 per cent respectively.

Comparative data on fuel levy for road maintenance and related items in some African countries and Nepal are provided in tables 4 through 6.

Table 4. Fuel levy (US cents/litre)

Country	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ethiopia	–	–	–	–	3.5	3.5	4.6	5.8	–	–	–	–
Ghana	–	–	4	5	6	7	8	8	–	–	–	–
Malawi	–	–	–	–	4.0	4.0	4.0	–	–	–	–	–
Nepal:												
Petrol	–	–	–	–	–	–	–	–	–	–	1.4	1.4
Diesel	–	–	–	–	–	–	–	–	–	–	0.7	0.7
Zambia	1.8	4.4	4.3	4.3	3.8	3.5	3.0	6.7	–	–	–	–

Table 5. Road maintenance expenditure

Country	Total road maintenance expenditure (US$ million)		
	1994	1999	2005
Ethiopia	10.0	17.0	–
Ghana	14.8	86.0	–
Malawi	2.7	10.0	–
Nepal	–	–	9.0
Zambia	3.0	5.0	–

Table 6. Available resources and expenditure

	Available resources for road maintenance as percentage of need	Expenditure as percentage of available resources
Ethiopia	70	95
Ghana	90	100
Malawi	50	90
Nepal	20	70
Zambia	30	90

II. ROADS BOARD NEPAL

A. Genesis

The Government of Nepal and the World Bank were instrumental in establishing the Roads Board Nepal (RBN). A road maintenance management and finance reform committee prepared the draft for the Roads Board Act, which was enacted by the Parliament in 2002.[1] RBN was established under this Act to provide adequate funding for sustainable road maintenance in the kingdom. It was designed to be self-reliant in organizing and managing its responsibilities.

RBN is funded through road toll, fuel levy and vehicle registration fees. RBN collects, manages and allocates funds for road maintenance to road agencies and is held accountable for the use of public money. The Department of Roads is the designated road agency for the maintenance of the strategic road network. The maintenance of urban, district, and local roads is undertaken through the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR). It coordinates with the district development committees and municipalities which are recognized as the road agencies for the local road network.

The Board ensures the participation of stakeholders in decision-making. It promotes a sense of ownership and responsibility from the public and private sectors. It is hoped that RBN will achieve results similar to those achieved by road boards in other developing countries.

B. The Roads Board

RBN's objectives are clearly defined in the Roads Board Act. They are phrased as follows:

> "The Roads Board has been hereby established to carry out routine, recurrent, periodic, and emergency repair and maintenance works of the road and to make an arrangement for imposition on and collection of tolls from the motor vehicles plying on the road."

[1] *The text of the Roads Board Act, 2002, and the Roads Board Rules, 2003, are available at <http://www.roadsboardnepal.org>.*

The Board is designed as an autonomous corporate body having perpetual succession. However, when necessary the Government may give direction to the Board. The Board is obligated to follow such government direction. The main functions, duties and powers of the Board are:

- To cause to carry out repair and maintenance of roads
- To collect tolls and charges for the use of roads and to recover penalties under the Act
- To make recommendations to the Government on matters concerning the fixation of road tolls, fuel levies under the Roads Boards Act and fines for motor vehicles that do not comply with established standard
- To formulate integrated annual plans for repair and maintenance of roads
- To provide funds to road agencies for the repair and maintenance of roads
- To disburse toll revenue at the prescribed rate for the repair and maintenance of roads from which tolls were collected
- To cause to reconstruct, rehabilitate and upgrade roads as prescribed
- To prepare an action plan for minimizing repair and maintenance expenses of roads
- To ensure effective repair and maintenance works of roads
- To approve the annual budget and programme of the Board

An executive committee carries out the functions of the Board. The committee is comprised of 13 members with the secretary of the Ministry of Physical Planning and Works as its Chairperson. Apart from the chairperson, there are four other representatives from the Government. The remaining eight members are from the private sector, professional bodies and other stakeholder groups. The Executive Director of RBN acts as the secretary of the committee.

The executive committee meets at least once in three months. The majority opinion prevails at the meeting of the committee. In case of a stalement, the chairperson exercises the deciding vote. The secretary of the committee authenticates the decision of the committee. The chairperson and members of the committee receive prescribed allowances for attending meetings.

The Roads Board Act defines road-related agencies as agencies that include a local body and carry out repair and maintenance works. Road agencies submit an annual programme, with prescribed details on repair and maintenance of roads, to the Board. The Board reviews the annual programmes obtained from the agencies and formulates an integrated annual programme for repair and maintenance of roads. It then informs the Ministry of Physical Planning and works about the annual programme. The Board provides fund to the road agencies for maintenance works included in the integrated annual programme after its approval. It also specifies repair and maintenance standards and checks to ensure that agencies have conformed to these standards. If a road agency fails to meet the specified standards, the Board as an ultimate measure has the authority to withhold further disbursement to the defaulting agency.

At any time, the Board may require road agencies to furnish details of repair and maintenance activities and the expenditures for such works. On completion of repair and maintenance works, agencies prepare reports using the prescribed format and submit them to the Board. If the Board asks for any assistance in the course of its business, the concerned agency is obligated to render the necessary assistance to the Board.

The Board's activities, accounts and matters concerning financial administration have to be transparent. It is mandated that the purchase, sale or procurement of contracts by the Board be through competitive public bidding. The Board prepares an annual report of activities and submits it to the Ministry within three months from the date on which the fiscal year ends and publishes the annual report in any national newspaper for information to the general public. Any person wishing to obtain the statement of income and expenditure, balance sheet or annual report of the Board may obtain copies after paying charges prescribed by the Board.

The Executive Committee has the authority to prepare necessary manuals and frame rules and by-laws. Such rules and by-laws come into effect after approval of the Government and may involve the following matters:

- Appointment, remuneration, facilities and condition of service of the Executive Director and employees of the Board;
- Use and operation of the proceeds of the fund;
- Release of funds for road repair and maintenance activities, and related financial procedures;

- Establishment of the modality to be followed in carrying out the Board's activities, accounts and fiscal administration, and road repair, maintenance and other activities;
- Other related matters.

C. RBN secretariat

RBN has a small secretariat with 17 staff headed by the Executive Director. The other staff members include five engineers, three management and finance experts, one office secretary, three assistants for administration and accounts, one computer operator-cum-receptionist and three support staff.

The Executive Director is selected by the Executive Committee from among several qualified candidates with requisite academic qualifications and job-related experience. The Executive Director is the administrative chief and is responsible for carrying out the day-to-day business of the Board. The term of office is for four years and may be extended for another term. The functions, duties, and powers of the Executive Director are as follows:

- Implementing the decisions and directions of the Committee
- Preparing short- and long-term plans, annual programs, and budget of the Board
- Implementing plans and programmes approved by the Committee
- Appointing employees required by the Board
- Submitting proposals for consideration and approval of the Committee
- Carrying out such other functions as may be prescribed

D. Roads fund resources

The Roads Board Act grants RBN authority over the following resources:

- Such levies on motor vehicles as may be prescribed by the Government by a notification published in the Nepal Gazette for using the roads mentioned in the notification
- Levies on fuel used by motor vehicles

- Vehicle licensing fees
- Tolls on motor vehicles registered outside of Nepal, collected upon entering the country

At present, three road sections are subject to tolls. In order to initiate the collection of tolls on additional roads, the new toll must be processed, approved and published in the government Gazette. The toll notification specifies road sections and tolls for different categories of vehicles, light, heavy and two/three wheelers. Fuel levies are currently collected at the rate of NRs 1.0 per litre for petrol and NRs 0.50 per litre for diesel fuel.[2] The Government has yet to allow collection of transit fees from vehicles registered abroad entering Nepal, although the process for collection is under development. The Board has begun to develop methods for collecting other resources, such as fees for vehicle registration renewal.

In addition, RBN may also receive funds from the following sources:

- Grants from the Government
- Grants or loans from foreign Governments or international organizations
- Amounts obtained from other sources

The Board must have the prior approval of the Government, however, before accepting grants or loans from foreign Governments or international organizations. All expenditures made on behalf of the Board have to be borne from the fund. Revenue collected for RBN is deposited in a commercial bank specified by the Executive Committee.

Roads fund expense items

Roads fund resources can be utilized for the following purposes:

- Administrative and operational expenses of the Board (maximum 4 per cent of the total revenue in each fiscal year)
- Repair and maintenance of strategic roads
- Repair and maintenance of district and urban roads on a cost-sharing basis as determined by the Board

[2] *The current exchange rate is NRs 72 to 1 US$.*

- Sharing the amount borne by the Government for donor-financed road repair and maintenance projects
- Road safety improvement projects as determined by the Board
- Enforcement of prescribed standards with respect to payload capacity and axle load of motor vehicles
- Research in repair and maintenance of roads

Any funds remaining after allocation for the above purposes may be used to upgrade existing roads or to carry out minor road related activities that the Board may prescribe based on the recommendations of RAs. However, this amount should not exceed 15 per cent of estimated revenue. If there is no immediate plan to spend the remaining funds, with prior government approval, the Board may invest in debentures or securities issued by the Government or *Nepal Rastra Bank.* The account of the Board is maintained in accordance with the laws in force and is audited by Office of the Auditor-General.

E. Procedures for fund allocation

RBN prepares comprehensive integrated annual plans (IAP) based on annual road maintenance programmes submitted by the RAs. RBN ensures optimum utilization of resources through a prioritization framework. As demand always supersedes supply, RBN follows a defined priority matrix. Priority is given to regular maintenance of good condition roads versus rehabilitation of poor condition roads. Road works are prrioritized in decending order as follows: routine maintenance, recurrent maintenance, periodic maintenance, rehabilitation, reconstruction and upgrading. Priority is also based on the type of road designated for maintenance or rehabilitation. Higher priority is given to roads from the strategic road network (SRN) than to roads from the local road network (LRN). These priorities are specified in the Roads Board Directive. RBN scrutinizes the annual road maintenance programmes submitted by the RAs for compliance with the Roads Board Directive and review works from previous fiscal years. Additional, the roads board examines human resource deployment, the capacity of the concerned agency, and the work standard from previous years.

Priority is also linked with traffic flow, terrain type and pavement conditions. The need for emergency maintenance is addressed through a predetermined reserve fund. A road deteriorated below maintainable condition is not given priority for regular maintenance until it is brought to maintainable condition by rehabilitation or reconstruction. RBN makes the final

decisions on allocations. It has the authority to monitor, control and check, evaluate and withhold the release of funds to non-performing road agencies.

The fund flow system is yet to be institutionalized as provisioned in the Roads Board Act and other relevant rules. The toll charges levied at three road sections are directly collected by RBN. Toll collection is outsourced to the private sector through contractual arrangements. The rule regarding fund flow requires collection of fuel levies from importers at the border by customs. These funds are then transferred to the RBN account. Similarly, vehicle registration fees collected by the transport management office is meant to be directly transferred to the RBN bank account. However, these rules have yet to be implemented. So far, such funds first go from the collecting agency to the treasury. Funds are released to RBN by the treasury via the Ministry of Physical Planning and Works. This arrangement does not maximize efficiency and attempts to streamline the system have been initiated by the RBN secretariat.

With regard to implementation, procedures in force in the concerned road agency are applicable until such time as RBN issues its own directives. RBN can guide the RAs for procurement of works by setting norms and standards. However, it has yet to do so and does not play any key role in procurement. This leaves procurement to the concerned RA. Although local agencies are encouraged to carry out works through competitive open-bid contracts, the Roads Board directive allows them to carry out works worth up to NRs 2.5 million through users committees. The Roads Board directive sets out clear procedures for conducting works through such committees to ensure accountability and transparency.

The total expected revenue from fuel levies and other user charges in the first year of RBN operation was NRs 1 billion. Because of the outbreak of conflicts in Nepal, economic activity declined and the actual revenue collected was far short of the expected amount. Furthermore, RBN has yet to receive the full proceeds from fuel levies and vehicle registration fees from the Ministry of Finance. Initiatives have been made to secure the transfer of these funds. These types of problems were anticipated and are expected to disappear as operational procedures are streamlined.

F. Current activities

RBN is in the process of approving its third year Integrated Annual Plan. Most of the pertinent rules and regulations of RBN have now been approved. Toll collection contracts are being managed, although this process has been complicated by road closures, limited liability actions and disputes.

Information dissemination workshops and training for stakeholders have been organized. The relationship with the RAs has been encouraging so far. Networking with national and international organizations working with similar facilities has also been established.

The World Bank has recently initiated a review of RBN's work. It is expected to analyse the shortcomings listed in this article and to suggest improvements. The secretariat is working on preparing financial plans for three revenue collection scenarios, minimum, optimal and desirable and to make suggestions to the Government about the toll and fuel levies for each scenario.

Allocations for the integrated annual plan for the financial years 2003-04 and 2004-05 and proposed allocations for 2005-06 are provided in tables 7 to 9.

Budget allocations were made for periodic maintenance of strategic roads under 11 divisional road offices through the Department of Roads (DOR) after receiving assurances that DOR has adequate funds for routine and recurrent maintenance from other government and donor-supported projects. A special decision of the Board has allowed rehabilitation and upgrading of some important local roads for the current fiscal year.

Table 7. Integrated annual plan and progress in fiscal year 2003-2004

Revenue		Expenses (NRs million)			Progress (percentage)
Sources	Amount (NRs million)	Activities	Budget/IAP	Expenditure	
Funds transferred from previous year	51.5	Administrative	4.8	4.3	90
Funds from Ministry of Finance	220.0	Refund of deposits	1.1	1.1	100
Toll collection	42.1	Maintenance of SRN	152.0	146.2	96.2
Other incomes	1.3	Maintenance of LRN 12 Districts	37.6	31.2	83.0
		Maintenance of LRN 22 Municipalities	99.0	65.1	65.8
		Reserve for emergency and adjustment of projected revenue	20.4	–	–
Total	314.9	Total	314.9	247.8	78.7

Table 8. Integrated annual plan and progress in fiscal year 2004-2005

Revenue		Expenses (NRs million)			Progress (percentage)
Sources	Amount (NRs million)	Activities	Budget/IAP	Expenditure	
Fund from Ministry of Finance	345.7	Administration	13.6	8.2	60.3
Toll collection	55.0 (Projected)	Maintenance of SRN	262.5	178.7	68.1
Other incomes: Bank interest and miscellaneous	2.1	Maintenance of LRN 32 Districts	61.9	25.2	40.7
		Maintenance of LRN 20 Municipalities	41.8	7.3	17.5
		Reserve for emergency and adjustment of projected revenue	23.0	9.1	39.6
Total	402.8	Total	402.8	228.5	56.7

Table 9. Proposed integrated annual plan for fiscal year 2005-06

Serial No.	Revenue		Serial No.	Expenses	
	Sources	Amount (NRs million)		Activities	Budget/IAP (NRs million)
1	Fund from MoF	316.8	1	Administration	13.2
2	Toll collection	55.0 (Projected)	2	SRN ~ 5 000 km	270.0
3	Other Incomes: Bank interest & miscellaneous	2.5 (Projected)	3	LRN 33 Districts	67.4
4	Savings from earlier works	26.1	4	LRN 33 Municipalities	49.8
	Total	400.4		Total	400.4

The district development committee has to provide a minimum of 20 per cent counterpart fund and carry out the works. Similarly, municipalities are to provide a minimum of 30 per cent counterpart fund. The figures in tables 7 to 9 represent only a portion of RBN funding.

It was possible for RBN funds, once disbursed to the RAs, to be carried over from one fiscal year to the next. For this reason, RBN allowed some works

to span more than one fiscal year. This created disincentives for the timely completion of road works, complicating the completion of IAP. In an attempt to address this issue, the practice of carrying funds over to subsequent fiscal years has been disallowed by RBN.

In 2004-05, the allocation to DOR has been exclusively for routine and recurrent minor works for the SRN and recurrent major works for road divisions with toll roads. This is in compliance with the rule stipulating that at least two thirds of tolls collected from a road have to be utilized for maintaining that road. In the case of local roads, most of the allocations were made for recurrent and periodic maintenance of priority roads under the jurisdiction of concerned local agencies.

For the current financial year, the RBN secretariat was able to identify the candidate roads according to the Roads Board Directive. The Directive requires that traffic levels on earthen roads average 15 vehicles per day and gravel roads average 40 vehicles per day to be eligible for funds. However, local agencies do not always agree with these criteria, as their priorities often do not meet traffic requirements.

Please note here that figures in tables 7 to 9 may not match with the corresponding figures in figure 2, as the figures in the tables include resources from sources other than RBN fund.

G. Challenges faced by the Board

Resource constraints are the main challenge faced by the Board. RBN funds only satisfy about 20 per cent of the total maintenance funding needs for SRN including periodic maintenance and rehabilitation. Less than 10 per cent of LRN needs can be met with RBN resources. However, there is also a serious concern regarding the utilization capacity of road agencies. Neither the Board nor the road users are satisfied with the performance of the road agencies, due mainly to their capacity constraints.

The estimated annual funding requirements for road maintenance are as follows:

- NRs 1 billion for 5,000 km of SRN
- NRs 330 million for 2,200 km of municipal roads
- NRs 541.8 million for 9,775 km of district and 11,949 km of village roads

The total need comes to about NRs 1.872 billion per year, which is equivalent to 1.8 per cent of the current road asset value. This is well within the range suggested by international organizations. If the Government remains committed to managing its road assets, mobilization of these funds should not be a major problem.

In order to increase resources for road management, the advantages of managing roads from a commercial point of view has to be clearly understood at the policymaking level and the benefits of sustainable maintenance should be clear to road users. Government's commitment to implementing a commercial approach to road maintenance has to be strongly expressed. Without strong political support, it would be difficult to address many of the current multifaceted management problems faced by the Board.

There are several problems stemming from ambiguities in the legal provisions that govern the Board. The demarcation of authority between different levels and entities is not always clear. This causes friction in board operations. Control by the National Treasury and Ministry of Finance has not always been in line with the spirit of establishing a dedicated roads maintenance fund. It is also expected that many of the problems experienced in the initial years will gradually disappear as the operational procedures and the fundamental purpose of establishing the Board becomes clearer to all concerned.

A common problem faced by the Board is the conflict between the purpose for which local authorities request RBN funds and the purpose for which RBN was established. Often, local authorities request funds for rehabilitation of roads in non-maintainable condition, whereas the RBN priority of funding is for regular maintenance of roads in maintainable condition. Resolution of this problem is not easy as the local agencies have significant political influence.

The modality of fund transfer to and from RBN must be streamlined. Many key people at the administrative and political decision-making levels are not adequately informed regarding the need for and suitability of the roads fund approach to sustainable road maintenance. This may be solved by exposing them to success stories from other developing countries.

Contradiction between the objectives of routine, recurrent, periodic and emergency maintenance and the inclusion of rehabilitation, reconstruction and upgrading in other sections of the Roads Board Act are creating problems at the operational level. Ambiguous phrasing of various clauses in the RBA has often

caused confusion regarding the Board's authority. A good example of this is confusion regarding the authority to raise tolls from selected roads through outsourcing.

Further, the absence of a corporate culture in the workplace, the present work style and non-competitive salaries and benefits for the RBN secretariat when compared with the private sector, harm staff morale and have a negative impact on the efficiency of the Board. Given the work load, the current staff strength is also not sufficient.

H. Future activities

RBN plans to undertake a number of activities in the future to improve its operational efficiency and the overall performance of the road sector through the provision of better road infrastructure services. The way forward is to develop directives, guidelines and manuals for technical standards, implementation modalities, fund flow mechanisms, and a reliable database. The road maintenance implementation practice by RAs must improve. This is essential for user satisfaction and to win their support for additional road user charges.

A comprehensive model for monitoring and evaluation is being developed by RBN. At the same time, a financial and a medium-term technical plan for road maintenance have to be formulated. Feedback from implementing agencies needs to be considered for improvement of operational procedures. Capacity-building activities for RBN and implementing road agencies also need to be considered. Institutional arrangements with the road agencies also need improvement. In order to win the support of road users, a wider consultation with public and other stakeholders is necessary. This should also help to raise public awareness about the purpose and functioning of RBN. Necessary changes in legislation, operational procedures and management practices have to be made. These should be modelled after good practices in other countries. Lastly, a corporate culture has to be established in the work place and better compensation packages should be offered to the RBN secretariat staff to improve morale.

CONCLUSION

Planned maintenance is essential to minimizing the life cycle cost of roads. A reform process to address this issue has been initiated in Nepal through the establishment of a dedicated roads fund and an agency for its

management. However, further steps must be taken to advance the reform agenda. International experiences could be of immense value for this purpose.

A number of challenges must be addressed in order to achieve sustainable management of Nepal's road network. Among the most important issues are institutional problems concerning management and utilization of the fund and capacity constraints in road agencies. Regular maintenance can deliver more efficient road service to the people. However, this requires sustainable flow of funds which can only be ensured through institutionalization of the fee-for-service concept. Securing support from policymakers, road agencies, the donor community and road users would be of paramount importance for this purpose.

With policy support, better planning, better implementation, and updated monitoring activities, road maintenance management could be much improved by RBN. These improvements will allow road users to benefit from safer, faster, less costly and more comfortable travel. Personal and government savings could be utilized for other social and economic activities, which ultimately would contribute to improving the general living conditions of the people.

REFERENCES

Deoja, B.B. 2005. Report on project formulation of the connectivity project in Nepal, TA Report, Asian Development Bank, Kathmandu.

Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR), 2004. *Inventory of Rural Road Networks,* His Majesty's Government, Nepal.

Department of Roads, 2002. National Road Statistics, His Majesty's Government, Nepal.

Heggie, I.G., 1995. Management and financing of roads: an agenda for reform, Technical Paper No. 275 (Washington, D.C., World Bank).

Robinson *et al,* 1998. Road Maintenance Management: Concepts and Systems (London, MacMilan Press).

Swiss Agency for Development and Cooperation (SDC), 1988. Report on improvement of road management in Nepal, Kathmandu.

SUSTAINABLE FINANCING FOR THE MAINTENANCE OF PAKISTAN'S HIGHWAYS

Major Gen. Farrukh Javed*

ABSTRACT

Under-financing and over-reliance on road transportation in Pakistan have led to the rapid and premature deterioration of its road assets, which are valued at over US$ 41.6 billion. In order to address this problem and meet the highway maintenance needs of the country, the Government has started an off-budget financing arrangement by establishing a road fund. The National Highway Authority has introduced a fee-for-service system on national highways under its jurisdiction. Toll revenues and receipts from other sources specifically earmarked for highway conservation are channelled through the road fund. This article describes the management and operational procedures of the road fund.

Keywords: Road fund in Pakistan, road maintenance financing, National Highway Authority, Road Maintenance Account.

INTRODUCTION

The transport sector currently accounts for about 10 per cent of Pakistan's GDP and 17.3 per cent of the gross capital formation. It comprises 35 per cent of Pakistan's annual fuel energy consumption. The sector generates a large number of employment opportunities, currently estimated at 2.3 million jobs or about 5.9 per cent of the employed labour force.

The performance of the transport system has been poor, with high economic losses from congestion and poor road quality. The situation is aggravated by a mismatch between supply and demand for transport infrastructure and services. It is estimated that the inadequate and inefficient transport system is imposing a cost to the economy in excess of Pakistan Rupees 220 billion or about 8.5 per cent of GDP, constraining economic growth,

* *Chairman, National Highway Authority, Islamabad; e-mail: azeemtahir@hotmail.com; time@isb.comsats.net.pk*

reducing export competitiveness and hindering social development. Pakistan's economic development depends much on the improvement and modernization of its key transport systems. To address this issue, the transport sector has been allocated 20 to 25 per cent of the Federal Public Sector Development Programme in recent years. Despite this, road maintenance expenditure has continued to fall short of the required amount.

Pakistan inherited a limited but well functioning transport system upon achieving independence in 1947. The road network was about 50,000 km long. About a half-a-century later, the total road network has expanded to nearly 260,000 km. This huge expansion of the road network induced a dramatic modal shift with over 83 per cent of the load shifting from rail to road over this period. From 1991 to 2001, inland freight and passenger traffic grew at an average annual rate of 10.6 per cent and 4.4 per cent, respectively. Pakistan has about 5 million vehicles on the road, growing at about 8 per cent annually. This includes about 250,000 commercial vehicles.

Although the national transport system consists of three modes (road, rail and air), road transport plays an overwhelming role. The inland water transportation system is basically nonexistent and coastal shipping only serves minor local movements. Pipeline transportation is still in its initial stage of development. Consequently, Pakistan relies very heavily on road transportation to carry inland freight and passenger traffic. The total inland traffic by road and rail transport is currently estimated at 239 billion passenger-kms of passenger traffic and 153 billion ton-kms of freight traffic. Road transport accounts for 91 per cent of passenger traffic and 96 per cent of freight traffic.

An efficient transport system is a prerequisite for Pakistan to become globally competitive. The future transport development strategy, inter alia, will emphasize asset management through consolidation, upgrading, rehabilitation and maintenance of the existing system. The strategy also takes into account regional and domestic scenarios that recognize the strategic location of Pakistan in the region. It considers enhancing regional connectivity by improving links to the Central Asian republics and other neighbouring countries. In order to take the advantage of its geographic location, Pakistan needs to improve its regional competitiveness in these corridors by improving its transport system. Failure to do so will amount to a lost opportunity for the country's trade-led growth.

I. NATIONAL HIGHWAYS AND MOTORWAYS

The National Highway Authority (NHA) is responsible for the development, operation and management of national highways, motorways and strategic roads. NHA came into existence in 1991 with an objective to plan, promote, organize and implement programmes for the construction, development, operation and maintenance of national highways and strategic roads. The National Highway Authority Act 1991, provides for the establishment of a supreme forum in the form of the National Highway Council. The Council is the supreme policymaking body for the transport sector and has the powers to control, direct and regulate the affairs of NHA. Following is the composition of NHA Council:

Composition of NHA council		
1.	Minister for Communications and Railways, Government of Pakistan	President
2.	Secretary, Finance Division, Government of Pakistan	Member
3.	Secretary, Communications Division, Government of Pakistan	Member
4.	A professional in the field of highway construction and management (nominated by the President)	Member
5.	A professional in the field of finance and accounts (nominated by the President)	Member
6.	Chairman, NHA	Member and Secretary of the Council

NHA has an Executive Board headed by its chairman and has eight other members. The Board gives general direction and executes all the administrative and operational affairs of NHA. It exercises all powers, performs all functions and undertakes all acts which may be exercised or performed by NHA. The composition of the Executive Board is as follows:

Composition of Executive Board		
1.	Chairman, NHA	Chairman
2.	Inspector General, National Highways and Motorways Police	Member
3.	Additional Secretary, Finance Division	Member
4.	Member or Additional Secretary, Planning and Development	Member
5.	Joint Secretary, Communications Division	Member
6.	Senior Chief, National Transport Research Council	Member
7.	Vice-President, NESPAK	Member
8.	Member (Planning), NHA	Member
9.	Member (Finance), NHA	Member

NHA has jurisdiction over about 9,000 kms of roads comprised of strategic and arterial routes that serve inter-provincial long-distance traffic. This includes roads that serve important commercial centres and major freight terminals. Although the length of national highways is only 3.3 per cent of the entire road network, they carry more than 80 per cent of the country's total road traffic.

Pakistan's national road transportation system mainly provides north-south links, connecting southern ports to the populous provinces of Punjab and the North West Frontier Province in the north. The two major north-south links are the Indus Highway (N-55) on the western bank of the Indus River and the Grand Trunk Road (N-5) on the eastern bank. The area on the western bank is mostly hilly and thinly populated. However, the area on the eastern bank is flat and the land is fertile and well irrigated. The majority of large population centres are on the eastern side of the country, concentrated along the N-5 corridor. In fact, of the eight population centres with a population of 1 million or above, seven are located along the N-5 corridor.

The current asset replacement value of the national highways is estimated at more than US$ 10.0 billion, representing one of the largest single asset investments in Pakistan.

II. THE CONDITION OF NATIONAL HIGHWAYS

The condition of Pakistan's road network is very poor. Travelling conditions do not meet acceptable standards. The poor conditions have been a major contributing factor to the 70 road fatalities per million people per year in the country. This is one the highest rates in the world and is imposing an estimated cost of US$ 1 billion per year.

Figure 1. Overloading of road vehicles

Past investment in the road sector has not been adequate. Lack of adequate resources affected maintenance of roads resulting in a huge backlog in development and maintenance projects. Planning and technical capacity constraints of road agencies are, however, also partly to blame for this condition.

The rapid growth in traffic volume, increase in axle load levels (as evidenced in figure 1), modal shift from rail to road and inadequate maintenance made the large asset investment embodied in the road network deteriorate at an alarming rate. Results of the pavement condition surveys conducted in 2005 show that 43 per cent of the roads under NHA are in poor to very poor condition.

The funding needs for maintenance versus expenditures and allocations are depicted in figure 2. Although the funding situation has improved in recent years and narrowed the gap between funding needs and actual allocations, it still falls short of what is required. An investment of approximately PRs 9.0 billion per year is needed to maintain and improve the ride quality of the NHA road network.

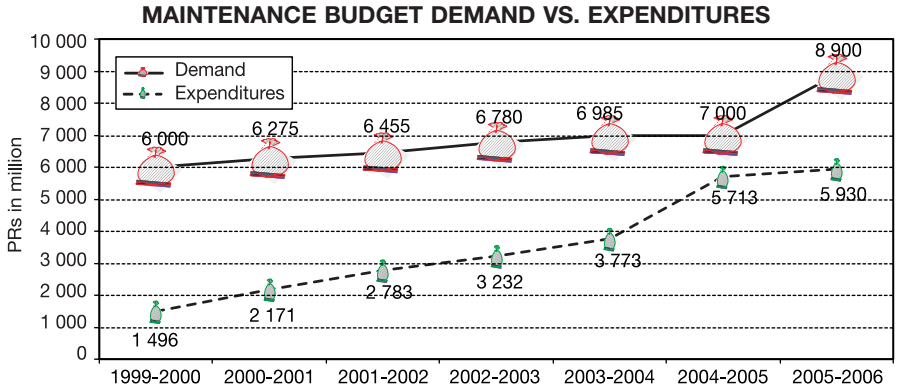


Figure 2. Funding needs for maintenance versus expenditures/allocations

The Government has realized the significance of timely road maintenance to the economy. Therefore it decided that NHA must undertake maintenance of the road network, not only because it is an asset worth hundreds of billions of rupees but also because it is vital to the growth of national economy.

Accordingly, NHA has articulated a new vision that emphasizes transition from the network expansion phase to a consolidation phase. The current focus is on preservation of road assets through timely maintenance and rehabilitation of the existing network. NHA is striving to maximize road maintenance through an off-budget financing mechanism to ensure that the past mistake of under-funding road maintenance is not repeated. It is actively devising innovative off-budget financing solutions for institutionalizing an effective and sustainable road maintenance programme.

III. COMMERCIALIZATION OF THE ROAD SECTOR

NHA is developing its role as a road infrastructure service provider by introducing commercialization in the road sector based on the following principles:

- Consider the principles of the market economy in road maintenance
- Undertake road maintenance based on a fee-for-service concept
- Manage road maintenance like a business rather than a government bureaucracy and promote a corporate culture within NHA.

NHA organized a national workshop to develop a consensus among the various stakeholders on achieving financial self-sufficiency and to win public support for the principle that road users should pay for the maintenance of roads in return for the service they receive. Participants attending the workshop reached a consensus on the following two matters:

- Additional revenues for road maintenance should come from road users
- Maintenance money should be channelled through a road fund

In line with the consensus reached at the national workshop, the Government took initiatives in setting up a road fund and established a mechanism for financing road maintenance from the resources generated by the fund.

IV. THE ROAD MAINTENANCE ACCOUNT/FUND

The National Highway Authority Act 1991, as amended in 2001, empowers NHA to benefit from the commercial use of roads and bridges entrusted to it. Under the Act, NHA is empowered to collect tolls on national highways. The Act also grants NHA the power to collect revenues from several other designated sources. Revenues collected from such sources are deposited into Pakistan's dedicated Road Maintenance Account (RMA).

The Road Maintenance Account was established to ensure a stable and secure source of maintenance and operations funding. NHA has framed rules for the RMA known as National Highways and Strategic Roads

Maintenance Fund Account Regulations-2002. The RMA's standard operating procedures describe, inter alia, maintenance categories, and utilization of RMA money. However, funds from the federal Public Sector Development Programme may also be obtained in the case of major rehabilitation and improvements and if such funds are available.

NHA has commenced implementation of the fee-for-use concept on national highways and strategic roads under its jurisdiction. Tolls are being collected from road users on almost all major highways. NHA collects tolls directly or enters into a contract with an outside party (selected mostly through competitive bidding) for that purpose. If NHA collects tolls directly, all receipts are deposited on a weekly basis in a RMA revenue sub-account for the region from which they were collected. The regional general manager ensures the transfer of all toll money from the regional RMA revenue sub-account to the central RMA account within seven days of the beginning of every calendar month.

In cases of collection through outside parties, the revenue transfer is made according to the contract signed between NHA and the concerned party. The operations and management unit of NHA ensures effective monitoring in both cases.

The statement of receipts into RMA is prepared every month. The monthly statement includes a performance report containing a comparison with projected receipts and suggestions for improvement, if any. Twice a year, on the 10th of January and July, a consolidated account statement is made available to all the members and the Chairman of the Executive Board for budgeting purposes. Central and regional RMAs are reconciled on a regular basis.

NHA has established tolling stations collecting tolls on almost all national highways and has started charging for the commercial use of right-of-way by collecting ground/approach rental charges. The policy guidelines for tolls and charges for the commercial use of right-of-way were approved by the NHA Executive Board as an interim measure until the final approval is made. The Board has constituted a committee to finalize the policy for tolling and preservation/commercial use of right-of-way.

It is expected that the total revenue generated for maintenance works in the financial year 2005-06 will be about PRs 4,310 million. The estimated funding requirement, determined through Highway Development and Management (HDM-IV) analysis, for the year will be PRs 7,000 million. Available total resources from different sources are expected to be as follows:

- Revenue receipts through RMA from all designated sources, PRs 4,730 million
- Government grants for maintenance, PRs 1,200 million
- Total resources available, PRs 5,930
- Shortfall, PRs 1,070 million

Toll revenue is the primary contributor of RMA resources. The contributions of different sources into RMA are as follows:

• Toll plazas	:	92.0 per cent
• Weigh stations	:	1.5 per cent
• Right-of-way commercialization	:	1.2 per cent
• Hoardings/billboards	:	0.3 per cent
• Police fine collection etc.	:	5.0 per cent

V. MANAGEMENT OF RMA

The Road Asset Management Directorate (RAMD) was established in April 2000 within NHA for better management of road maintenance activities and revenue generation through RMA. RAMD provides the necessary system and human resources to ensure adequate generation of revenues, conservation of road assets and quality infrastructure services to road users. Under the new maintenance regime, the road user must be treated as a customer. Road user satisfaction is of primary importance for the promotion of "fee-for-road service concept".

The Organizational Structure of the RAMD unit is provided in figure 3. The General Manager (Operations) also acts as the Executive Director of RAMD. RAMD is functionally divided into three main components:

- Operation and Management Unit (OMU)
- Road Asset Management System (RAMS) Unit
- National Highway Improvement Programme (NHIP) Unit

The aim and function of OMU is to generate revenue through commercial use of road assets. The RAMS unit is responsible for preparing and managing the implementation of maintenance programmes, whereas the NHIP unit is responsible for coordinating donor agency programmes and promoting private sector participation and commercial operations.

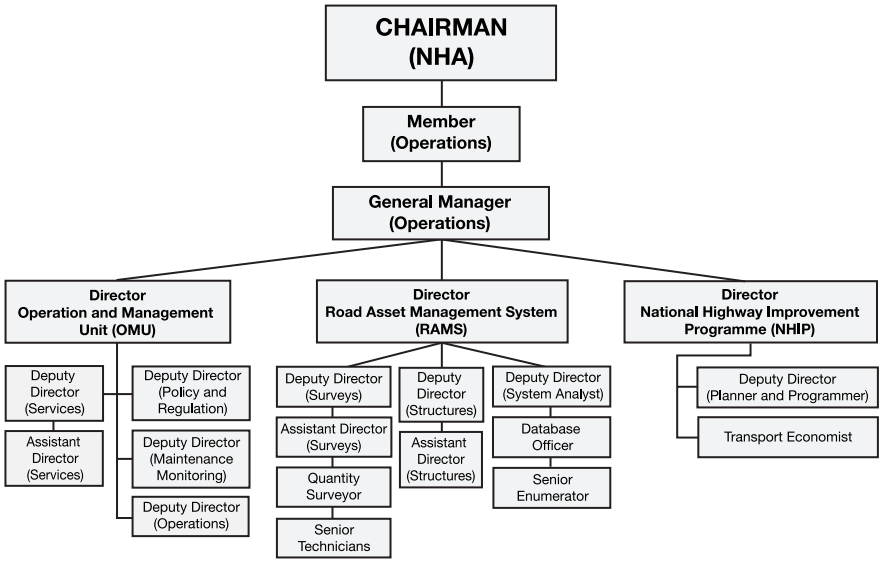


Figure 3. The organizational structure of the Road Asset Management Directorate

The RAMS unit prepares an annual maintenance plan (AMP) and strategic business plans for the annual and future maintenance of the highways. It also provides a prioritized list of road links, for which the service providers (NHA's six regional offices supported by a number of other field offices) are required to prepare their proposed programme. This list will have clear and concise reasons for the order in which works estimates should be prepared. The list will form an integral part of an NHA-approved programme design. The design will give clear and concise guidelines on what should be addressed in the maintenance works, and what should be left out.

The whole process of estimating the maintenance works follows a set of procedures which are open and transparent and involve the senior management from both the planning and highway divisions within NHA. The level and depth of work to be included are determined by considering road classification, the constructed asset value and the recommended periodic intervention as estimated by the Maintenance Modelling System of HDM or similar tools.

The expenditures form the RMA cover the following maintenance categories:

- Routine, periodic and emergency maintenance
- Rehabilitation
- Geometric improvement and highway safety improvement
- New toll plazas and weigh stations
- Corridor management

VI. THE ROAD ASSET MANAGEMENT STRATEGY

The road asset management system of RAMD has developed a cyclical operations system. The system has the key role for the following functions:

- Conducting an annual network analysis
- Updating the existing central road databank
- Developing an annual business plans
- Identifying maintenance activities with high potential for maintaining asset values
- Estimating the current asset value of the network
- Preparing annual profit/loss statements for the network after each year's analysis

The network analysis process involves the following activities:

- Forecasting of revenue generation/investment
- Distress survey of roads and bridges
- Roughness measurement survey
- Strength evaluation survey
- Traffic survey
- Collection of historical data
- Assessment of performance standards and treatment rules

The annual work cycle followed by RAMS is presented in figure 4.

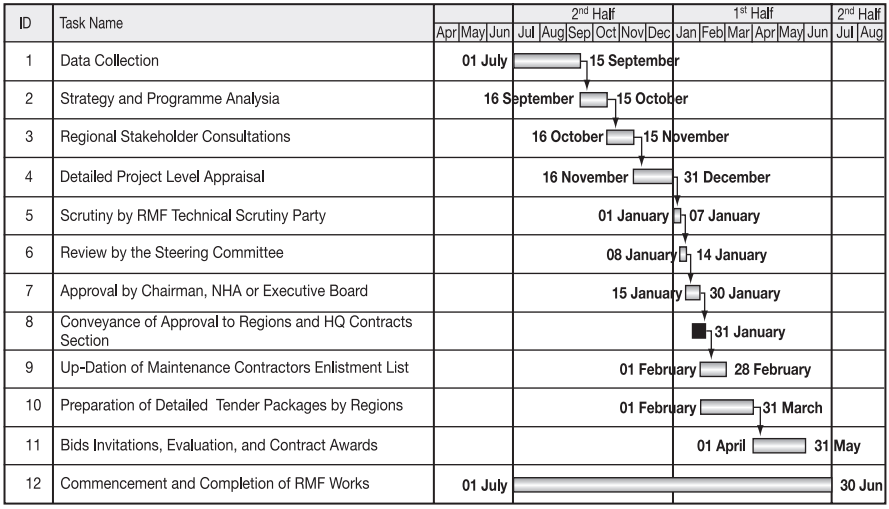


Figure 4. Work cycle of the road asset management system

VII. MANAGEMENT OF THE ROAD MAINTENANCE ACCOUNT

It is mandatory to obtain administrative approval from the competent authority before funds from the Road Maintenance Account can be allocated for eligible expenditures. The approval is made after considering the scope of work, its rough cost estimate and its necessity.

RAMD prepares a draft annual maintenance plan (AMP) for the Technical Scrutiny Party (TSP) of RMA, who after careful examination, submit the AMP to the RMA's steering committee. The steering committee reviews and forwards the AMP for approval of the Chairman and the Executive Board.

RAMD conveys administrative approval for the projects finally included in the annual programme. This information is used for preparation and competitive procurement by the regional offices and the contract section at NHA headquarters. Regional offices and the contract section at the headquarters, update records of maintenance contractors and prepare detailed tender documents.

The financial statements and accounts of RMA are audited annually by an independent and reputable firm of chartered accountants engaged by the NHA Executive Board. The printed audit report is submitted to the NHA

Executive Board within five months of the end of every financial year. The NHA Executive Board also periodically engages an independent reputable firm or a professional individual for undertaking a technical audit of the activities financed by the RMA.

VIII. IMPLEMENTATION OF THE ANNUAL RMA PROGRAMME

Regional offices and the contract section at the headquarters invite tender biddings for road maintenance works, evaluate bids and award contracts to winning bidders. If bid prices are considered high due to lack of "effective" competition, the competent authority may instruct re-tendering from a wider contractor pool.

The maintenance works cycle commences from 1 July of every calendar year and is completed before the end of the same financial year. The financial year ends on 30 June of the next calendar year. Except where notified by the competent authority at the time of administrative approval, regional offices are responsible for the supervision of maintenance contracts financed from RMA. They send monthly progress reports to RAMD in an agreed format.

Changes in contract specifications are not allowed after the work is awarded. However, if such a change is warranted on extremely solid technical grounds, it requires prior approval of the competent authority. Revised technical sanction and administrative approval are also necessary if the project costs exceed 15 per cent.

IX. MANAGEMENT INFORMATION SYSTEMS AND PERFORMANCE INDICATORS

RAMD carries out performance monitoring of the works through the regular review of monthly progress reports and random field visits during each maintenance year. It submits a summary of these reports to the Chairman and the NHA Executive Board.

RAMD submits summary outputs of the Highway Development and Management (HDM) strategy analysis and recommendations for adjustments in resource mobilization, if any, to the NHA Executive Board through the Chairman. It monitors key performance indicators at the network level and includes them in its annual report to the Chairman and the Executive Board.

The Directorate prepares a comprehensive annual report on its activities. The annual report includes details of data collection; programme development including strategy and prioritization; stakeholder consultations; programme appraisal, scrutiny, review and approval process; procurement of works, goods and services; implementation of the approved programme; achievement of targets; and all other activities specified in the RMA Rules.

X. IMPROVEMENT ATTAINED THROUGH RMA

The following major achievements have been made by implementing RMA from 2000 to 2005:

- **Roughness** : Reduction in IRI from 6.0 to 5.0
- **Road condition** : NHA network in poor condition reduced from 59 per cent to 43 per cent
- **Economic saving** : Reduction in vehicle operating costs amounting to savings of over PRs 50 billion
- **Travel time** : Approximately 7 per cent reduction in travel time
- **Safety** : Improvement in road safety conditions

CONCLUDING REMARKS

Over the last five years, enhanced financing of road maintenance has considerably improved road conditions, safety and travel time. However, available resources through the current financing mechanism still fall short of meeting maintenance funding needs. For this reason NHA will have to enhance its revenue generation by bringing more road sections under tolling, by increasing the existing toll rates and by promoting commercial activities along highways. Consideration should also be made to set up a road development fund in order to meet the costs of new road development projects, such the North-South Motorway Corridor. In order to secure the continuing support of road users for the fee-for-service concept, the current level of service on national highways also needs to be improved. Introduction of the corridor management concept with greater private sector involvement, enhanced safety and security measures on roads and application of new technologies, such as intelligent transport systems, can help to improve the level of road transport service in the country and enhance its economic competitiveness.

FINANCING ROADS IN THE UNITED REPUBLIC OF TANZANIA: CHALLENGES AND STRATEGIES

J.O. Haule*

ABSTRACT

Available funds for road maintenance in the United Republic of Tanzania declined so much over the years that by 1990 only 15 per cent of trunk roads and 10 per cent of rural roads were in good condition. To reverse the situation, the road sector has undergone reforms with far-reaching effects. As a part of this reform process, the Roads Fund and the Roads Fund Board were established by an act passed by the Parliament in 1998. The main functions of the Roads Fund Board are to collect and disburse funds and to monitor its utilization by roads agencies. The Board has made a number of achievements, including an increase in revenue collection, allocating 100 per cent of the maintenance budget based on available funds and ensuring a stable and regular flow of funds. The experience of operating the fund is the subject of discussion of this article.

BACKGROUND

The United Republic of Tanzania has a road network of approximately 85,000 km. This includes trunk, regional, district, feeder and urban roads, about 5 per cent of which are paved (table 1). The road asset value, including bridges, is estimated to be US$ 2.6 billion. Comparative road asset values in some neighbouring countries are provided in table 2.

It can be seen that road assets form a major part of each country's wealth. In the case of Ghana and Malawi, the value approaches that of their annual GDP. It is prudent therefore to have in place adequate financial and managerial capacities to maintain this important asset in a sustainable manner.

Until the 1970s, the Tanzanian economy performed well, with both agriculture and industry growing at moderate rates. Road maintenance was well managed and available resources were adequate for this purpose. In 1968,

* *Roads Fund Manager, Roads Fund Board, United Republic of Tanzania; e-mail: jhaule@raha.com.*

Table 1. Road length in the United Republic of Tanzania by category

Category	Paved (km)	Unpaved (km)	Total (km)
Trunk roads	3 830	6 470	10 300
Regional roads	100	24 600	24 700
District roads	30	19 970	20 000
Feeder roads	0	27 550	27 550
Urban roads	470	1 980	2 450
Total	4 430	80 570	85 000

Source: Louis Berger (2000).

Table 2. Comparative road asset values and other related statistics (2003)

Country	Population (millions)	Roads (thousand kms)	Surface area (thousand sq kms)	GDP (US$ billions)	Road fund revenue (US$ millions)	Road asset value (US$ billions)
Ghana	21	49	238	6.2	75	4.6
Malawi	12	16	118	1.9	15	1.5
Tanzania (United Republic of)	36	80	945	9.9	60	2.6

Source: Andreski (2005).

for instance, funds were allocated for road maintenance at the rate of US$ 800 per kilometre for bitumen roads. For engineered gravel and earthen roads, the allocations per kilometre were US$ 400 and US$ 230, respectively. By the early 1980s, the gap between public expenditure and aggregate supply widened. The current account deficit was about 15 per cent of GDP, inflation was about 30 per cent and the currency was substantially overvalued.

With those difficulties, the level of public expenditure allocated for road maintenance declined to such a low level that by 1990 only about 15 per cent of trunk and 10 per cent of local government roads were in good condition. To address this problem, there have been ongoing reforms in the road sector since 1998, with far-reaching effects. As a part of this reform process, the Government established the Roads Fund and the Roads Fund Board under an act passed by the Parliament. The Government also established the Tanzania National Roads Agency (TANROADS) with the responsibility of managing the trunk and regional roads on the mainland.

The envisaged reforms helped to address many of the institutional problems, namely inadequate funding for road maintenance, cumbersome administrative and procurement procedures and unmotivated staff. These problems in the past led to considerable project delays, cost overruns, backlog of maintenance works and loss of confidence from road users as well as donors.

Roads have a direct impact on the welfare of the rural poor. The process of poverty reduction is embedded in a broad range of socio-economic activities to which roads and services provide intermediate inputs (Gannon and Liu 1997). It has been shown by a study in the United Republic of Tanzania that there is a marked decline in the income of households living at a distance of more than 5 km from a good road. It is important to note that the distance to the nearest good road also provides a measure of national physical integration. The further the household lies from a good road, the less likely it would be to have access to markets or other economic and social facilities and opportunities. Isolation is a key indicator of poverty.

Poor roads and the resultant inability to transport people and goods, limit the facilitating role of transport in both production and consumption activities. The link and impact lie in the fact that improved transportation leads to improved accessibility to economic and social opportunities by reducing transport costs. It also ensures increased agricultural productivity, opens up room for participation in non-agricultural activities through time saving, improves accessibility to education and health services, and it links rural communities to the rest of the economy. Maintenance works in rural areas have proven to be an important source of income and distribution of wealth. In the case of urban areas, the quality of transportation and other types of infrastructure appear to play a significant role in reducing inflation, because transportation costs have been found to be a significant component in the total cost of foodstuffs, affecting the survival of urban dwellers.

The United Republic of Tanzania's vision 2025, envisages an economic transformation that will enable it to move from the status of least developed country to a medium income country. In the process, the transport sector is expected to develop an extensive road network that is well maintained and serves all parts of the country as well as neighbouring countries.

This paper discusses achievements made by the Tanzania Roads Fund Board and the challenges that it is currently facing. In addition, it presents strategies adopted by the Fund and possible solutions to these challenges.

I. THE ROADS FUND BOARD

The Roads Fund and the Roads Fund Board were established under the Roads Toll (Amendment) No. 2 Act of 1998. The Board, with members drawn from the public and private sectors and assisted by a small secretariat, oversees the management of the Roads Fund established under the Act. The Fund generates its resources from a number of sources designated by the Act, which are discussed in the next section.

The vision of the Board is to improve the well-being of Tanzanians through the use of a road network maintained to a level comparable to leading countries in the Southern Africa Development Community region. Its mission is to ensure an adequate and stable flow of funds to implementing agencies and monitor the funds utilization for sustainable road maintenance.

Composition of the Board

The nine member of the Roads Fund Board have tenure of three years. The composition of the Board is as follows:

1. Chairperson
2. Permanent Secretary, Ministry of Works
3. Permanent Secretary, Ministry of Finance
4. Permanent Secretary, President's Office, Regional Administration and Local Government
5. A senior civil servant; Director of Electrical and Mechanical Division, Ministry of Works
6. A representative of the United Republic of Tanzania Truck Owners' Association
7. A representative of the Confederation of Cooperatives
8. A representative of the Association of Tour Operators
9. A representative of the Roads Association

The Chairperson of the Board is appointed by the President. The members of the RFB are also members of the Ministerial Advisory Board for TANROADS and the Permanent Secretary, Ministry of Works is the chairperson of this advisory board. The chairperson of RFB serves as an ordinary member.

The Board has a small secretariat with a staff of 10. They include the roads fund manager, the roads fund accountant, two planning and monitoring engineers, the internal auditor, accounts assistant, two office management secretaries, one office attendant cum registry clerk and the office messenger cum driver.

Functions of the Board

The main functions of the Board as provided in the Roads Toll Act are:

- To advise the roads Minister on new sources of road tolls, on adjustment of existing toll rates and on regulations for the collection of road tolls;
- To set procedures for the collection of road tolls by agents;
- To develop and periodically review the formula for the allocation and disbursement of funds to agencies and advise the roads Minister accordingly;
- To make recommendations to the roads Minister regarding the allocation of funds to TANROADS, local authorities and other road agencies and disburse funds to them;
- To monitor the use of the funds disbursed to road agencies;
- To appoint the road fund manager and road fund accountant;
- To appoint an auditor or auditors to carry out audits of the Fund;
- To make other recommendations to the roads Minister it considers necessary.

In addition, the Act requires the Roads Fund Board:

- To enter into performance agreements with the Chief Executive of TANROADS or other agencies to which money from the fund is disbursed;
- To submit an annual report to the roads Minister on its own activities and on organizations to which money was disbursed.

II. OPERATION AND MANAGEMENT OF THE ROADS FUND

A. Source of funds for road maintenance

The sources of funding for the Roads Fund are: fuel levies, transit charges, overloading fees and heavy vehicle licence fees. The first two sources are collected by the Tanzania Revenue Authority, the third by TANROADS and the last by the Central Transport Licensing Authority. Collections for the financial year 2003-2004 are shown in table 3.

Table 3. Source of roads funds and collections for 2003-2004

Source of roads funds	Amount (TSh)	Percentage of total
Fuel levy	64 113 252 331	95.2
Transit charges[a]	1 406 335 567	2.1
Overloading fees	1 634 434 164	2.4
Heavy vehicle licence fees[b]	188 239 500	0.3
Total	**67 342 261 562**	**100.0**

Source: Roads Fund Board Secretariat, February 2005.

Notes: [a] Transit charges are charges paid by all cargo vehicles entering the United Republic of Tanzania from neighbouring countries. The charges are per kilometre and are collected by the Tanzania Revenue Authority at the border posts.

[b] The heavy vehicle licence fee was abolished effective 1 July 2005.

The Board followed up with the Ministry of Finance on untransferred road funds for 1999-2000. As a result, a total of 2,866,801,063 Tanzanian shillings (TSh) from fuel levy collections had reverted to the Fund by June 2000. TRA started depositing the fees in March 2000 and TANROADS started depositing overloading fines starting in November 2000. These have led to increased funding for rural roads.

B. Funds for road maintenance

There has been an increased levels of funding since the Roads Fund was first established in 1991. Table 4 shows revenue collections since 1991 and its distribution to various road agencies in the United Republic of Tanzania, namely the Ministry of Works, TANROADS and the President's Office of Regional Administration and Local Government (PORALG).

Table 4 indicates that there has been a significant increase in road fund revenues after RFB started its operations in 2000-01. Annual collections increased from 3 per cent per year before the Board was established to 20 per cent after its establishment.

Table 4. Road fund collection and allocation (TSh millions)

Year	Collection	MOW*	PORALG
1991-92	3 742	2 464	616
1992-93	6 841	5 337	1 334
1993-94	14 272	8 515	2 317
1994-95	21 199	16 266	3 797
1995-96	28 308	16 000	4 000
1996-97	25 399	15 998	3 450
1997-98	33 745	15 000	2 600
1998-99	38 365	29 819	12 779
1999-00	39 392	25 639	10 468
2000-01	47 252	29 184	10 847
2001-02	52 881	35 498	15 240
2002/2003	59 390	46 772	19 302
2003-04	67 342	45 364	19 146
2004-05 (estimates)	73 414	51 610	21 804

Source: Roads Fund Board Secretariat, February 2005.

Note: * = Includes allocations to TANROADS and the Roads Fund Board since 2000-01.

C. Allocation of funds

The flow of funds and their distribution are depicted in figure 1. The road fund disbursement criteria since financial year 2000-01 are as follows. After deducting the expenses of the Roads Fund Board, 63 per cent of the remaining balance is disbursed to TANROADS and 30 per cent to PORALG. The remaining 7 per cent is disbursed to the Ministry of Works for development projects. The disbursement formula was not fully complied with in the years before RFB was established. However, since the establishment of RFB, the distribution formula has been fully complied with.

The Ministry of Works is the custodian of trunk and regional roads. TANROADS is the agency under the Ministry that manages these roads, while the Ministry manages development projects. However, in the near future,

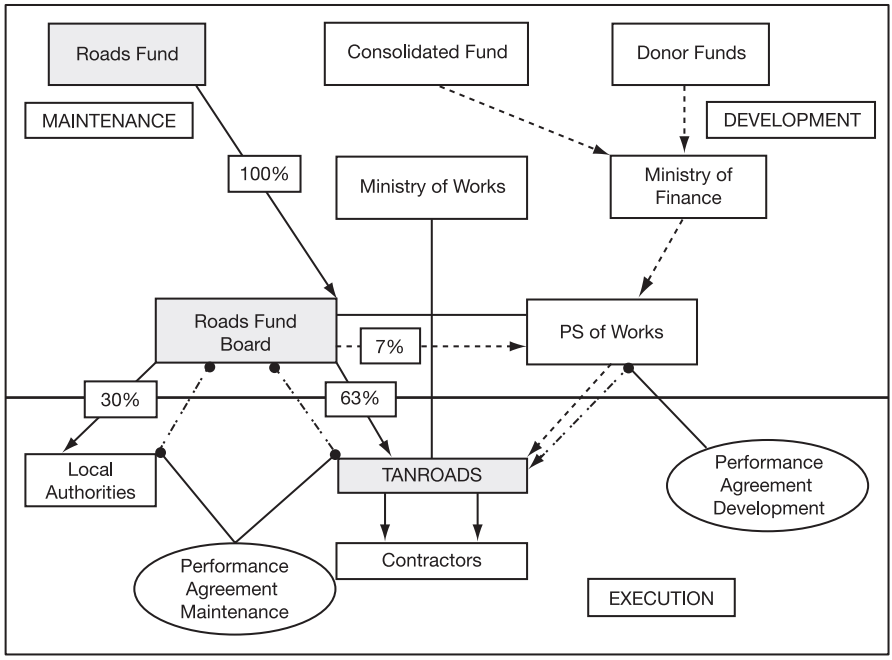


Figure 1. Flow of funds in the road sector

responsibility for development projects will be transferred to TANROADS, allowing the Ministry to revert to a regulatory and policy-setting body. PORALG on the other hand, is responsible for managing the district, feeder and urban roads through the local authorities or councils.

D. Planning and budgeting

Every year, the Roads Fund Board provides annual budget estimates to the implementing agencies. The implementing agencies then prepare and submit their annual work programmes and budget proposals to the Board for approval. After examination the proposals are sent to Parliament for approval. Subsequently, the Board enters into performance agreements with the concerned implementing agencies and disburse funds according to the agreements.

In the past, only a part of the required budget for road maintenance could be made available. The situation has completely changed in the new road maintenance finance regime. Table 5 provides budgets and actual disbursement figures for recent years. From the table, it can be seen that the

maintenance budgets for the implementing agencies are now fully met, allocations have significantly increased and, unlike in the past, a stable flow of funds has been ensured.

It should be noted that the disbursement figures for MOW/TANROADS in table 5 differ from those in table 4. This is because the figures in table 5 show only maintenance allocations to TANROADS while those in table 4 also include allocations to MOW for development projects and to the Roads Fund Board for its operating costs.

Table 5. Budgets of major road sector service providers versus actual allocations

Year	Ministry of Works/TANROADS			PMO/PORALG		
	Budget[a]	Actual Disbursement[a]	Allocated[b]	Budget[a]	Actual Disbursement[a]	Allocated[b]
1997-98	19 971	11 419	57	–	–	–
1998-99	27 560	24 609	89	–	–	–
1999-00	25 500	21 985	86	13 897	10 468	75
2000-01	25 765	25 632	99.5	14 160	10 847	77
2001-02	31 390	31 390	100	15 239	15 239	100
2002-03	40 155	40 155	100	19 302	19 302	100
2003-04	40 206	40 206	100	19 146	19 146	100

Source: Roads Fund Board Secretariat.

Notes: (1) The last disbursement for PORALG in FY 2000-01 was received in June 2001 but disbursed in July 2001 because of delay in getting fund allocation to local authorities from PORALG headquarters.

(2) Information could not be obtained for PORALG budgets for years 1997-98 and 1998-99.

[a] In millions of Tanzanian Shillings

[b] Per cent of budget actually allocated to the service providers

E. Management of the fund

The Board has put in place a small secretariat, which handles the day-to-day activities of the Board. The secretariat is highly efficient. It uses a modern financial management system known as EPICOR which was adopted by the Government for its institutions. EPICOR is a computerized accounting system that facilitates timely preparation of financial statements, quarterly expenditure and income reports; and similar documents. The Board has worked out procedures and systems for managing the funds. These include

interim financial regulations, interim staff regulations, fund disbursement procedures and monitoring procedures. These measures have improved accountability and efficiency in the utilization of funds.

The Board has also streamlined procedures for the collection and disbursement of funds by opening special accounts with a commercial bank (CRDB). Funds to local authorities are now sent directly to their respective accounts by telegraphic transfer. In the past, cheques had to be collected from PORALG headquarters in the town of Dodoma and it was necessary to wait for 28 days for the cheques to clear. Thanks to the new arrangement, funds now arrive at the local authority's account on time and payments can be made without delays.

F. Performance agreements with implementing agencies

Performance agreements with implementing agencies have been improved by incorporating several new clauses and including more easily measurable performance indicators in the agreements. Examples of indicators used in the performance agreements are:

(a) Grass height not more than 50 cm;

(b) Potholes patched within 48 hours on paved roads in good condition;

(c) Clean and reflective road signs visible at 40 m;

(d) All roads in good condition in the maintenance plans;

(e) At least 25 per cent of contracts for labour-based activities given to women;

(f) All routine maintenance works awarded to local contractors;

(g) At least 20 per cent of periodic maintenance contracts awarded to local contractors;

(h) At least 80 per cent of works outsourced.

The Board has also included an article in the performance agreement addressing such policy issues as:

(a) Prioritizing gender issues, especially the employment of women in the road sector;

(b) Providing employment opportunities for local people;

(c) Using labour-based technologies;

(d) Ensuring minimal environmental degradation, including restoring borrow pits;

(e) Increasing outsourcing of works and services;

(f) Implementing awareness campaigns about HIV/AIDS.

Regarding gender issues, the results so far are promising, with women benefiting from road works activities. In Mwanza, for instance, equal wages of TSh 1,200 per day were paid for men and women performing piecework. The women stated that this income was essential for them to meet family needs. Some women provided other income earning services for road workers, such as selling food, soft drinks and local beer. Women spent their wages on their families, especially children.

G. Monitoring

Financial audits have assisted in ensuring that roads funds were properly collected, disbursed and utilized by the concerned agencies. Technical audits have ensured that maximum value is gained from money utilized on maintenance works. As a result of monitoring visits by the Board and its secretariat, the performance and accountability of the implementing agencies have improved considerably. The following are few examples:

(a) During visits in 2000 it was noted that many local authorities had insufficient qualified staff, especially engineers. The Board requested that PORALG address this issue. As a result many engineers have been employed;

(b) It was noted that many local authority engineering offices lacked work supervision vehicles. This resulted in poorly conducted road condition surveys, complicating the preparation of designs, tender documents, annual work programmes and budgets. To address this problem, the Board has allocated TSh 1,220 million in 2004-05 to buy supervision vehicles. Procurement is expected to take place in three phases starting in 2004-05;

(c) Inadequacies in the process of procuring contractors were observed in many local authorities. Improper filing of records and account keeping and deficiencies in managing contracts were also observed. The local authorities were advised in these matters and improvements have been noticed;

(d) It was observed that many local authorities were diverting funds for unauthorized activities. The Board, in collaboration with PORALG, withheld subsequent allocations to them until the money was recovered. The problem is now far less pronounced.

H. Stakeholder involvement

The Board organized two stakeholders' meetings, in May 2000 and August 2001. One of the issues addressed in the first meeting was stakeholders' awareness concerning the role of roads in economic and social development. This was an attempt to revive concerns about the losses to the economy incurred from bad roads. The meeting was opened by the President of the United Republic of Tanzania. The second meeting was meant to solicit views from stakeholders on the widening of the road fund base. Stakeholder involvement in decision-making has helped to address issues related to financing and management of rural roads. In the past, such forums did not exist.

The Board launched the *Road User* magazine as a forum for exchanging views with road users. Through the magazine, road users can be informed about road fund collections, disbursements and work in progress. It is hoped that this will bolster public support and confidence in road maintenance activities. Four issues of the magazine have been released so far.

The Board publishes the release of funds to implementing agencies in newspapers such as the *Guardian,* the *Daily News,* and the *Uhuru* on a quarterly basis. Information regarding allocations to rural roads can easily be followed up by stakeholders, particularly stakeholders living in rural areas.

III. EFFECTS OF IMPROVED ROAD MAINTENANCE

Road conditions have visibly improved owing to increased maintenance activities. For example, the percentage of roads in good condition under local authorities has increased from a mere 8.7 per cent in 2001-2002 to 25 per cent in 2003-2004. Many important rural roads that were impassable during the rainy season are now passable throughout the year. The improvement in road conditions has significantly reduced travel time and cost. Table 6 provides examples of such travel time and cost reductions.

Significant reductions in travel time and cost have greatly helped the rural economy by improving market access for agricultural produce and generating new economic activities. Farmers received better prices for their

Table 6. Examples of time- and cost-saving benefits from improved road maintenance

Sector	Distance (km)	Travel time (hours)		Travel cost (Tanzanian Shillings)	
		Before	After	Before	After
Njombe-Ludewa	160	6-12	2-3	5-7 000	2-3 000
Njombe-Makete	110	6-12	2-3	6 000	4 500
Songea-Tunduru	264	12-18	6	10-18 000	4-5 000
Songea-Mbambabay	170	6-8	3	10 000	5 000

Source: Compiled from data provided in Shila et al. 2002.

crops after roads were improved. For example, in Ludewa and Songea districts, the selling price of 100 kilograms of maize increased from between TSh 3,500-4,000 to 20,000. Previously, fish sold at Songea (a town located in the south of the United Republic of Tanzania) came from Mtera Dam, located 450 km away. However, with the improvement in road conditions, fish is now marketed from Mbambabay and Lituhi, which are located at a much closer 170 km and 120 km respectively. Previously fish could not be transported from Mbambabay and Lituhi because roads leading to these areas were not serviceable.

Road maintenance also contributed to an increase in the income of rural people. A study conducted on the Msalabani-Tawa road in the Morogoro district of the Morogoro region found that villagers who participated in labour-based road projects were earning a daily wage of TShs 1,200 for a period of not less than 7 months a year (K & Associates, 2004). This forms a significant off-farm cash income for participating rural people and is used to meet some of their basic needs.

IV. CHALLENGES

There are, however, a number of challenges faced by the Roads Fund Board. Its efficacy in the future may depend much on satisfactory resolution of many of these issues. Considering their importance, these issues are discussed next.

Road inventory and condition survey

In the absence of a detailed inventory of the current road network conditions, any assessment of road maintenance needs becomes largely

a theoretical exercise and may lead to the preparation of questionable and ineffective work programmes. Lack of a detailed inventory also complicates the task of determining the amount of road user charges and the development of an equitable formula for the allocation of funds to road agencies and their distribution between local authorities.

TANROADS has carried out an inventory of their road network. Available data from the survey indicate that the network is comprised of 9,934 km of trunk and 18,957 km of regional roads. The information collected is being verified to allay suspicions that part the network has been left out. Another study is being conducted to ascertain the conditions of the network administered by PORALG. Information from this study is expected to be available soon. In addition to accurate inventories, further work needs to be undertaken relating to traffic information systems including an assessment of road signage and safety conditions.

Inadequacy of funds to maintain the entire road network

The estimated total asset value of the country's road network is about US$ 2.6 billion. Table 7 provides more details of the estimated asset values by type and condition of roads. The current allocation for road maintenance from the Roads Fund is about US$ 71 million per year, which is about 2.8 per cent of the asset value. This level of allocation is on par with the ECLAC recommendation of 2.5 to 3.5 per cent (Andreski 2005).

However, a detailed study carried out in 2001 indicates that the required maintenance funding for the entire network is about US$ 166 million or TSh 188 billion, assuming the whole 85,000 km road network is in maintainable condition. The study has corroborated reports from various other studies. The estimate is based on best currently available information and is regarded as the most accurate assessment of the state of the road network.

Revenue collection for the fund in 2005-06 is expected to be TSh 80.413 billion, which is only about 43 per cent needed to maintain the entire network. In addition, 10 per cent of the funds collected must be allocated to new road development as required by the Roads Toll Act. Taking this into account, the estimated annual requirement comes to about US$ 183 million. If only roads that are currently in maintainable condition are considered, the funding requirement for maintenance works is US$ 89 million. However, the actual amount available for regular maintenance could be smaller than the allocated amount. Given the condition of the network, it is prudent to assume that part of the available funds will be spent on urgent repairs needed to keep

Table 7. Condition and asset value of roads by type

Road category	Total length (km)	Road condition (percentage of roads)			Estimated asset value (millions of US dollars)			Total asset value (millions of US dollars)
		Good	Fair	Poor	Good	Fair	Poor	
Trunk roads								
Paved	3 904	62	31	7	968	242	27	1 238
Unpaved	6 141	39	40	21	96	49	13	158
Regional roads								
Paved	245	74	23	3	54	8	1	63
Unpaved	18 220	40	35	25	219	96	23	337
District roads								
Paved	30	24	29	47	2	1	1	4
Unpaved	19 970	24	29	47	120	58	47	225
Feeder roads								
Unpaved	27 550	24	29	47	132	80	65	277
Urban roads								
Paved	470	24	29	47	113	82	33	228
Unpaved	1 980	24	29	47	19	11	9	40
Total asset value for all roads								**2 569**

roads in serviceable condition. This means that some of the roads currently in good and fair condition will not receive due regular maintenance. Consequently, future requirements may be even higher.

Backlog of maintenance for district, urban and feeder roads

The backlog of maintenance for trunk and regional roads including accumulated rehabilitation works, is estimated to cost US$ 590.33 million. Of the total 50,000 km of district, urban and feeder roads, only 25 per cent is estimated to be in good condition. This means that there is a great need for periodic maintenance and rehabilitation works. In reality, road funds allocated to local authorities are mostly used for rehabilitation and urgent repairs and not maintenance works.

Given the overall unsatisfactory condition of the network, a substantial amount of funds are actually utilized for spot improvement and emergency works to ensure their serviceability instead of carrying out routine and periodic maintenance works. In 2003-2004, about one fifth of Roads Fund allocations to PORALG was utilized for spot improvement, emergency repairs and contingencies.

Lack of coordination in financing road works in local governments

There are a number of other sources of funds apart from the Roads Funds, which are not coordinated by PORALG. It is difficult to know how these funds are utilized. Currently, there are a number of donors, NGOs and government agencies involved in road works at the district level. The central Government also disburses funds to the local road authorities. The experience of the Board with fund utilization by local authorities suggests that the use of these funds should be coordinated in order to ascertain the real needs of the local authorities. This is especially important because, in the final analysis the Board is responsible for the maintenance of all roads. Donor funds for trunk and regional roads are coordinated by the Ministry of Works and appear in the budget although implementation may be done directly by a donor.

Tax evasion

Fuel levies are the main source of revenue generation for roads funds. However, under-reporting of fuel sales and fuel import malpractices have led to heavy evasion of fuel levies. Revenue audits indicate that, as of April 2005, the Board has incurred revenue losses of about TSh 3.8 billion in fuel levies due to storage losses, doubtful re-exportations, uncollected fuel levies and blending of petroleum products. An estimate of the loss of revenue from the aforementioned causes is provided in table 8.

Table 8. Estimated fuel used by vehicle class

Vehicle class	Number*	Annual distance travelled (km)	Fuel consumption (litres per 100 km)	Type of fuel	Estimated fuel used – Petrol (million litres)	Estimated Fuel used – Diesel (million litres)	Estimated total fuel used (million litres)
Motorcycles	48 149	10 000	4	Petrol	19.26	–	19.26
Light vehicles	252 783	20 000	10	Petrol	505.57	–	505.57
Heavy vehicles	129 632	50 000	25	Diesel	–	1 620.41	1 620.41
Tractors	10 185	1 000	30	Diesel	–	3.06	3.06
Construction	8 334	1 000	30	Diesel	–	2.50	2.50
Total	**462 973**				**524.83**	**1 625.96**	**2 150.79**

Source: Africon Engineering International (Pty) Ltd. (2004).

Note: * Excluding government, diplomatic and military vehicles.

The reported sales of petrol and diesel fuels in the United Republic of Tanzania were 193.96 million litres and 521.89 million litres, respectively. These figures, however, are far smaller than their corresponding estimated consumption figures of 524.8 million litres of petrol and 1,626.0 million litres of diesel. The estimates were based on the number of vehicles, vehicle utilization and fuel consumption by each type of vehicle.

By applying the current level of the fuel levy of TSh 90 to the annual fuel consumption, it gives total fuel levy revenue of TSh 193.57 billion per year. However, the expected revenue from fuel levy in 2004-2005 is only TSh 79.47 billion, which is about 41 per cent of the potential revenue from this source. If the full amount of potential revenue could be collected, the Roads Fund would be able to meet the maintenance funding needs of the whole network.

Other sources of funds for road works

Only a few local authorities allocate part of their own resources for road works. This is due mainly to their limited revenue base and the competing demands of other high priority issues. The local authorities however, receive "other charges" from the Ministry of Finance for administrative activities related to maintenance works. Since, the Roads Fund cannot meet the entire funding requirement, it is necessary for the local authorities to allocate their own funds for the maintenance of rural roads. It is also important to have cost-sharing arrangements between the local authorities and the Roads Fund Board.

Allocation of funds

The distribution of funds between Ministry of Works and PORALG has been a 70:30 ratio for a number of years. PORALG has stated that they need a larger share than the current allocation of 30 per cent. There is a need to review the formula taking into account the economic and social considerations to come up with a rational formula.

Distribution between local authorities

Distribution of funds between local authorities is based on the following criteria:

(a) 85 per cent of the road fund is distributed equally to all districts and urban/municipal local authorities (equity criteria);

(b) 3.5 per cent of the road fund is distributed to local authorities in proportion to the population;

(c) 3.5 per cent of the road fund is distributed to local authorities in proportion to the road network length;

(d) 1 per cent is set aside for the Urban Sector Rehabilitation Programme;

(e) 4 per cent of the fund is equally allocated to the municipal councils;

(f) 2 per cent of the road fund is equally allocated to the town councils;

(g) 1 per cent is set aside for the monitoring expenses of PORALG.

This allocation protocol has resulted in all local authorities receiving roughly the same level of funding regardless of the type of roads (paved/unpaved), road lengths, type of area (urban/rural) under their jurisdiction. In many cases, funds are so thinly spread at the local level that they have very little impact. Also, a number of local authorities give priority to roads in poor condition, ignoring good roads. As a result, rural roads that get inadequate maintenance interventions do not last long and the roads in good condition ultimately experience rapid deterioration, wasting resources.

Overloading

Overloading of vehicles is quite common despite efforts to curb it. Currently, 7 per cent of vehicles weighed are found overloaded. Overloading is mainly controlled on paved trunk roads that connect to other roads, especially unpaved ones. Many rural roads have been destroyed by overloaded vehicles. Damage to the roads from overloading puts more pressure on the Roads Fund to inject more money for repairs.

Capacity of the engineers' offices

Many local authority engineers are not professionally registered. There are 229 engineers working in 113 local authorities across the country; 64 of them are registered as professional engineers, 19 as technician engineers, 54 as graduate engineers and 11 as graduate technician engineers. A total of 63 engineers are not registered with any professional body, while 18 engineers do not have qualifications to be registered as professional engineers. Of the 229 engineers, 129 are road engineers.

Technical staff employed by local authorities are mainly limited to the local authority engineer and a few technicians. Frequently these staff members have other engineering responsibilities such as building classrooms, dispensaries or other community facilities. Engineers' offices lack computer facilities. Engineers also lack the capacity for procurement and contract administration and supervision, which often leads to low budget utilization. The low capacity of engineers' offices is a primary cause for poorly managed roads (Haule, 2003).

Capacity of contractors

Many of the local contractors are small contractors who cannot bid for large works. They also do not have heavy equipment for road works. Many contractors do not have qualified technical staff. In a number of areas, the number of contractors is inadequate to meet local needs. Maintenance works on rural roads, particularly periodic maintenance, have been affected by the low capacity of contractors. This is especially true when tenders have had to be re-advertised due to low or no turnout of tenderers.

Misuse of funds

Misuse of funds by implementing agencies has been observed. Reasons for the misuse included corruption, political interference, inadequate capacity of contractors, poor application of procurement procedures, lack of professional skill and lack of capacity to manage projects. The audit report for 2003-2004 indicates that, while the RFB received high performance marks, the other agencies received lower ratings (National Audit Office 2004). The audit report revealed the following weaknesses on utilization of the funds, particularly by local authorities:

(a) Ineligible expenditure, transfer, and diversion of funds;

(b) Poor accounts and stores records;

(c) Outstanding imprests;

(d) Questionable expenditures;

(e) Diversion from the performance agreement;

(f) Poor procurement procedures;

(g) Poor contract administration, supervision and works.

Road safety

The United Republic of Tanzania has a very high rate of road accidents. The number of persons killed in relation to the number of motor vehicles is 30 to 40 times higher than in most countries in Western Europe and is also higher than in neighbouring Kenya and Zimbabwe. In 2003, 1,788 fatal accidents killed 2,155 persons. Accident statistics for 2004 show an alarming 7 to 11 per cent increase in the number of accidents and the number of people killed and injured. The cost of traffic accidents is estimated at 2 per cent of GDP or over Tsh 170 billion in 2002 (SweRoad 2004). Many of these accidents were the result of poor road conditions. This situation could be improved by determining better ways to utilize funds to ensure safety.

V. STRATEGIES

The Board has formulated a strategic three-year plan to address the above-mentioned challenges. The plan is to span the 2005-06 to 2008-09 fiscal years and was developed in collaboration with the concerned stakeholders. The proposed strategies are discussed briefly in the following sections.

Increased revenue generation for the Roads Fund

The Board updated the recommendations for widening the Roads Fund base and made a resubmission to the Tax Task Force of the Ministry of Finance. The recommendations were based on meeting the National Strategy for Growth and Reduction in Poverty (NSGRP) also known by its acronym in Swahili as MKUKUTA targets over a five year period from 2005-06 to 2009-10. The recommendations were to increase the rates of existing levies and introduce new instruments as follows:

Fuel levy

It was decided to increase fuel levies on all fuels from TSh 90 per litre to TSh 100 per litre in 2005-06 and thereafter rising to TSh 140 per litre in 2009-10 with an increment of TSh 10 per year. With the increased rate, it was expected that TSh 79.47 billion would be collected in 2005-06.

Licence fees

The main recommendations included were:

(a) The licence fees for all vehicles should be designated as revenue for the Roads Fund;

(b) The definition of 3.5 tonnes for a heavy vehicle should be accepted and enforced;

(c) The collection agent CTLA should retain 30 per cent of licence fee revenues to meet the administrative costs;

(d) The licence fees for commercial and cargo vehicles should be increased by 50 per cent.

For 2005-06, it was expected that TSh 4.49 billion would be collected from licence fees.

Transit charges

There was no recommendation with respect to transit charges as these charges are harmonized across the SADC and cannot be adjusted by an individual country. For 2005-06, it was expected that TSh 1.42 billion would be collected as transit charges.

Overloading fees

The current rates on overloading fees will continue to apply. The expected revenue collection from this source in 2005-06 is TSh 2.14 billion.

Transit fees/foreign vehicle permits

These charges are harmonized across the SADC and cannot be adjusted by an individual country. The current rates will be applicable. The expected revenue collected from this source in 2005-06 is TSh 0.87 billion.

A study to widen the Roads Fund base for sustainable road financing was carried out in 2001. The recommendations have already been submitted to the Government for consideration. Widening the Roads Fund base will ensure increased funding for rural roads. Annual vehicle licence fees, transit fees and foreign vehicle permit fees collected by the Tanzania Revenue Authority (TRA) are among the new revenue sources recommended (Africon 2001).

Total amount of revenue

The total amount of revenue expected from all sources in 2005-06 is TSh 88.59 billion (equivalent to US$ 75.27 million). If the recommendations to widen the roads fund base are implemented, there will be a considerable increase in funding but there will still be a gap between revenue collection and maintenance needs. By 2009-10, the projected revenue is expected to increase to TSh 174.94 billion (US$ 140.26 million). After allowing for a 10 per cent allocation to development projects, the remaining 90 per cent will be available for maintenance needs. The maintenance needs are expected to grow from TSh 106.63 billion to 166.16 billion (US$ 90.60 million to 126.23 million) during the same period. This implies that the maintenance gap will decline over this period from TSh 26.90 billion (US$ 22.86 million) in 2005-06 to TSh 8.71 billion (US$ 6.98 million) in 2009-10. It is recommended that the donor community assist in bridging the funding gap.

VI. FUTURE PLAN OF THE BOARD

To address the challenges discussed in the previous section, the Board has taken up a plan involving a number of activities. The objectives of these activities include increased awareness among policymakers and stakeholders, enhanced capacity of the Board and implementing agencies, and increased flow of funds. In addition, the plan calls for increased availability of information and better utilization of allocated resources to improve Roads Board efficiency.

Road investment policy and harmonization with other Acts

A proposal for the review of the Roads Toll Act will be prepared to harmonize some provisions that conflict with other Acts. It will also prepare a policy paper on road investment for the Ministry of Works and undertake advocacy for increased allocation to the road sector. Forums of stakeholders and partner agencies will be organized to seek their support.

Improvement in fuel levy collection

The Board will undertake a number of initiatives to increase available funding. Preventing fuel levy evasion will be a major part of this effort. Pursuant to this goal, the Board will conduct a special revenue audit and implement measures to stop fuel levy evasion as recommended in the audit reports. It also plans to organize forums with TRA to formulate strategies for improvement in revenue collection.

Improving the performance of implementing agencies

The Board intends to develop and establish a monitoring and evaluation system. It also plans to conduct technical and financial audits to improve the performance of the implementing agencies. It will organize a forum with the implementing agencies to discuss the road maintenance manuals and guidelines. It will then distribute them with the existing financial guidelines. It will also undertake various activities in support of capacity-building for implementing agencies, contractors and consultants.

Improving the operations of the Board

A major effort will be made to verify road network data from TANROADS and PORALG. Additional efforts will be made for capacity-building in the RFB secretariat. It will also prepare educational and information materials on protective road utilization and conduct a mass media programme on the importance of road preservation. In order to increase the Board's own accountability and transparency, an external evaluation of RFB activities will be undertaken. The Board will also organize workshops to facilitate the review of its activities by concerned stakeholders and the Government.

Review of the allocation formula

The Board intends to review the formula for the allocation of funds between road agencies under Ministry of Works and PORALG and for the allocation of funds between local authorities. This issue is important to the agencies. PORALG wants a greater share of resources, and distribution between local authorities should better reflect their needs. The Board has engaged a consultant to carry out a study for this purpose.

Maintenance backlog and road development

The Board will follow up with the Government in an effort to revive a study on a 10-year investment programme for the whole road network. The 10-year plan would reduce pressure on the Roads Fund by funding spot improvements and emergency road works. This would mean more funds would be available for the regular maintenance. The objective is to bring all roads up to maintainable condition.

Curbing the misuse of funds

The Roads Fund Board has already taken some corrective measures concerning the management of funds. A number of actions are being implemented following the audit reports. These include:

(a) Stopping further disbursement to implementing agencies which diverted funds until the diverted amount is returned to the roads accounts;

(b) Reporting engineers and contractors responsible for poor work to their respective registration boards for disciplinary action;

(c) Investigating implementing agencies suspected of fraudulent practices.

(d) Taking disciplinary action against officials found to have misused funds or who are connected to questionable expenditures.

Improving capacity of engineers' offices

PORALG has taken measures to increase the capacity of engineers' offices. These measures consist of recruitment of engineers and other technical staff, training of engineers in procurement and contract management, and provision of logistical support including vehicles for supervision and installation of a computerized road maintenance management system called DROMAS.

Road inventory and condition survey

TANROADS has completed its road condition and inventory survey for trunk and regional roads. PORALG is in the process of implementing a road inventory and conditions survey together with classification of its roads this year. Road conditions will be updated regularly. It is expected that annual bookkeeping of road asset values will be implemented. The performance of the officials responsible for road networks will be assessed by means of a number of performance indicators, including the change in road asset values.

Community participation

A number of communities participate in road works voluntarily. Greater involvement of communities in road works will help to ensure that more roads are in maintainable condition. Involving communities helps to create a sense of ownership and creates jobs that will reduce poverty.

Improvement of road safety

The issue of road safety has drawn the attention of the Government. A National Road Safety Master Plan and an action plan for the next three years have been prepared. TANROADS is implementing the plans. They contain a number of recommendations, including 11 key recommendations that must be implemented if the United Republic of Tanzania is to reverse the current trend in road accident rates. The Roads Fund allocated TSh 700 million (US$ 619,469) in 2004-05 for implementing safety improvement measures and will continue to do so on an annual basis.

VII. CONCLUSION

The main objective of the Board is to ensure funds for road maintenance and development and the proper utilization of these funds. The Board has had some success in this regard. It has also encountered a number of challenges. With the implementation of the adopted strategies, it is hoped that the Board will achieve its goal of supporting national economic growth by ensuring maintainable roads that satisfy the needs of road users. In pursuit of this overarching goal, the Government may consider harnessing additional resources from domestic and foreign sources in an effort to bring all roads up to maintainable condition and formulate a comprehensive road sector policy.

REFERENCES

Africon Engineering International (Pty) Ltd., 2001. "Study to Review Road User Charges and Rates for Sustainable Road Financing", Final Report (Dar es Salaam, Roads Fund Board).

Africon Engineering International (Pty) Ltd., 2004. "Final Project Documentation", consultancy services for management support (Dar es Salaam, Roads Fund Board).

Andreski, Adam, 2005. "Case study of road Funds in Ghana, Malawi and Tanzania", paper prepared for Senior Executives Course 2005 at the University of Birmingham, United Kingdom.

Gannon, Colin A. and Zhi Liu, 1997. "Poverty and Transport", TWU Discussion Paper (Washington, D.C., World Bank).

J.O. Haule, 2003. "Paper from Roads Fund Board for project implementation review workshop for the urban sector rehabilitation project", Bagamoyo, United Republic of Tanzania.

K & Associates Professional Services, 2001. "Criteria for allocating Roads Funds to Districts and Design of an Appropriate Disbursement and Monitoring System", Final Report (Dar es Salaam, Roads Fund Board).

K & Associates Professional Services et al., 2004. "Comparative Study on the Impact of Labour-Based and Equipment-Based Methods in Road Works in Tanzania" (Dar es Salaam, Ministry of Works).

Louis Berger S.A., 2000. "Study of Tracking the Roads Funds" (Dar es Salaam, Ministry of Finance).

National Audit Office, 2004. "Audited Accounts and Management Audit Report on the Financial Statements of the Local Government Roads Fund for the year ended 30th June 2003" (Roads Fund Board Tanzania).

Roads Fund Board, 1999. "The Roads Tolls (Amendment) No. 2 Act of 1998", Dar es Salaam.

Roads Fund Board, 2002. "Performance Agreement between the Roads Fund Board and PORALG for FY 2002/2003", Dar es Salaam.

Roads Fund Board A, 2004. "Performance Agreement between the Roads Fund Board and TANROADS for FY 2004/2005", Dar es Salaam.

Roads Fund Board B, 2004. "Performance Agreement between the Roads Fund Board and PORALG for FY 2004/2005", Dar es Salaam.

Shila, W. et al., 2002. "Road maintenance under Ruvuma and Southern Iringa Road Maintenance Programme (RUSIRM)", paper presented at the Annual Roads Convention, Dar es Salaam.

SweRoad, 2004. "Study for development of national road safety master plan for Tanzania mainland and Zanzibar", Dar es Salaam.

Vice President's Office, 2005 "National Strategy for Growth and Reduction of Poverty (NSGRP)", Final Draft, Dar es Salaam.

Transport and Communications Bulletin for Asia and the Pacific

General guidelines for contributors

1. Manuscripts

One copy of the manuscript in English should be submitted together with a covering letter to the Editor indicating that the material has not been previously published or submitted for publication elsewhere. The author(s) should also submit a copy of the manuscript on computer diskette, labelled with the title of the article and the word-processing programme used, or by e-mail as an attachment file. MS Word and WordPerfect are the preferred word-processing programmes.

The length of the manuscript, including tables, figures and bibliographical references, should not exceed 7,500 words. Manuscripts should be typed on one side of A4 paper in double spacing and pages should be numbered. A list of references should be included. Manuscripts are subject to editorial revision.

The title page should contain (a) title; (b) name(s) of the author(s); (c) institutional affiliation(s); (d) complete mailing address, e-mail address and facsimile number of the author, or of the principal author in the case of joint authors; and (e) an abstract of approximately 150 words clearly stating the main conclusions of the article. Acknowledgements, if any, should appear at the end of the text.

Articles should include a final section containing the main conclusions, which should be broadly intelligible to a non-specialist reader.

2. Tables

All tables should be clearly headed and numbered consecutively in Arabic numerals. They should be self-explanatory. All tables should be referred to in the text. Full source notes should be given below each table, followed by general notes, if any. Authors are fully responsible for the accuracy of the data.

3. Figures

All figures should be provided as camera-ready copy and numbered consecutively in Arabic numerals. All figures should be referred to in the text. Full source notes should be given below each figure.

4. Footnotes

Footnotes, if any, should be brief and numbered consecutively in superscript Arabic numerals. Footnotes should not be used for citing references.

5. References

There should be a complete reference for every citation in the text. References in the text should follow the author-date format, for example (Sadorsky, 1994), or (Skeldon, 1997: 243). Only those references actually cited in the text should be listed and these should appear in alphabetical order at the end of the manuscript. References should be in the following style:

[Book]
Skeldon, R., 1997. *Migration and Development: A Global Perspective* (London, Longman).

[Chapter in book]
Krueger, Alan, B. and Lawrence H. Summers, 1987. Reflections on the inter-industry wage structure, in K. Lang and J.S. Leonard, eds., *Unemployment and the Structure of Labour Markets* (London, Blackwell), pp. 40-49.

[Article in journal]
Wachs, M., 1990. Regulating traffic by controlling land use: the southern California experience, *Transportation,* vol. 16, No. 3, pp. 241-256.

كيفية الحصول على منشورات الامم المتحدة

يمكن الحصول على منشورات الامم المتحدة من المكتبات ودور التوزيع في جميع انحاء العالم • استعلم عنها من المكتبة التي تتعامل معها أو اكتب الى : الامم المتحدة ،قسم البيع في نيويورك او في جنيف •

如何购取联合国出版物

联合国出版物在全世界各地的书店和经售处均有发售。请向书店询问或写信到纽约或日内瓦的联合国销售组。

HOW TO OBTAIN UNITED NATIONS PUBLICATIONS

United Nations publications may be obtained from bookstores and distributors throughout the world. Consult your bookstore or write to: United Nations, Sales Section, New York or Geneva.

COMMENT SE PROCURER LES PUBLICATIONS DES NATIONS UNIES

Les publications des Nations Unies sont en vente dans les librairies et les agences dépositaires du monde entier. Informez-vous auprès de votre libraire ou adressez-vous à : Nations Unies, Section des ventes, New York ou Genève.

КАК ПОЛУЧИТЬ ИЗДАНИЯ ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ

Издания Организации Объединенных Наций можно купить в книжных магазинах и агентствах во всех районах мира. Наводите справки об изданиях в вашем книжном магазине или пишите по адресу: Организация Объединенных Наций, Секция по продаже изданий, Нью-Йорк или Женева.

COMO CONSEGUIR PUBLICACIONES DE LAS NACIONES UNIDAS

Las publicaciones de las Naciones Unidas están en venta en librerías y casas distribuidoras en todas partes del mundo. Consulte a su librero o diríjase a: Naciones Unidas, Sección de Ventas, Nueva York o Ginebra.

Printed in Bangkok
December 2005 – 680

United Nations publication
Sales No. E.05.II.F.34

ISBN: 92-1-120448-8
ISSN: 0252-4392
ST/ESCAP/SER.E/75

United Nations
ESCAP

United Nations
Economic and Social Commission for Asia and the Pacific
Transport and Tourism Division
United Nations Building, Rajadamnern Nok Avenue
Bangkok 10200, Thailand
Tel.: (66 2) 288-1371 Fax.: (66 2) 280-6042
http://www.unescap.org/ttdw/
E-mail: escap-ttd@un.org
escap-publicationsoffice@un.org

United Nations 60
A Time for Renewal